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TO: Development Review Board
FROM: Scott Gustin SG
DATE: January 7, 2014
RE: 14-0466PD; 140 Grove Street

Note: These are staff comments only; decisions on projects are made by the Development Review Board, which may approve, deny, table or modify any project. THE APPLICANT OR REPRESENTATIVE MUST ATTEND THE MEETING.

Zone: RL Ward: 1

Owner/Applicant: Ireland Brothers Corp. / Patrick O'Brien Development, LLC

Request: Preliminary plat review for major Planned Unit Development to demolish existing concrete plant and associated commercial buildings, construct 12 new residential buildings with 247 residential units with associated road, parking, and site improvements.

Applicable Regulations:
Article 3 (Applications and Reviews), Article 4 (Maps & Districts), Article 5 (Citywide General Regulations), Article 6 (Development Criteria & Guidelines), Article 8 (Parking), Article 9 (Inclusionary and Replacement Housing), Article 10 (Subdivision), and Article 11 (Planned Unit Development)

Background Information:
The applicant is seeking preliminary plat approval for a 247-unit residential development, including 12 multi-family buildings and associated site improvements. Demolition of existing commercial buildings is also proposed. The applicant undertook several sketch plan reviews with the Development Review Board, Design Advisory Board, and Conservation Board.

The project is proposed as a major planned unit development (PUD). The PUD process affords some degree of flexibility from a rigid application of the dimensional standards and unit types typically allowed in a residential zone in order to address the overall intent described by Article 11 of the CDO. Sec. 11.1.11 is intended to preserve important features and resources, to encourage a variety of housing types, to achieve a high level of design, and to provide for more efficient provision of infrastructure (which comes by way of smaller lots and buildings closer together rather than all spread out on large lots). While PUD affords a degree of flexibility, it does not supersede the rest of the CDO.

The Conservation Board reviewed this preliminary plat application on November 4, 2013. The Board felt that improvements had been made since sketch plan and requested additional stormwater management information, particularly as related to the potential for onsite infiltration, at final plat review. The Board did not issue a formal recommendation.

The Design Advisory Board initially reviewed this preliminary plat application on November 12, 2013. The preliminary plat review was continued to allow the applicant time to make changes to the proposal. Requested changes related to strengthening the interior streetscape, reducing parking, incorporating additional smaller buildings, depicting installation details for the proposed siding, and improving the front entries of the smaller multi-unit buildings. Revised plans reflecting modest changes, mostly to parking layout, were submitted. The Design Advisory Board voted 3-2 to recommend denial of the preliminary plat application at their November 26, 2013 meeting. The recommendation for denial was based on the scale and massing of the proposed buildings and their incompatibility with the intent of the Residential Low Density (RL) zone as articulated in the Comprehensive Development Ordinance. Except for this incompatibility with the intent of the RL zone, the DAB felt that the project was basically good and presented as a new neighborhood with a design that generally worked for what it was.

Following the DAB's recommendation for denial, staff and the applicant met to discuss the project. The applicant chose to keep the project design as originally proposed and proceed to the Development Review Board. To be clear, the applicant is requesting review of the November 12, 2013 version of the project plans – not the revised November 26 version.

Staff concurs with the Design Advisory Board's recommendation for denial. Despite consistent comment to introduce smaller buildings, a stronger more cohesive streetscape, and parking behind buildings into the project design, the project continues to be one of large and larger apartment buildings, ill-defined streetscape, and prominent parking in front of all of the buildings. The project continues to completely disregard the express intent of the Low Density Residential zone in which it is located. There is nothing in this proposal even resembling a compact residential neighborhood with small lots or buildings, narrow setbacks, and a network of small streets contemplated for this zone by the CDO.

Previous zoning actions for this property are noted below.

- 11/10/97, Approval of lot line adjustment with neighboring parcel

Recommendation: **Preliminary Plat Denial** as per the following findings:

Article 3: Applications and Reviews
Part 5, Conditional Use & Major Impact Review:
Sec. 3.5.6, Review Criteria
(a) Conditional Use Review Standards
1. The capacity of existing or planned community facilities;
The proposed development will be served by municipal water and sewer. As noted by the Technical Review Committee, municipal water service may be insufficient to serve this development. Upgrades that may be needed would be at the expense of the developer. No details have been provided in the application relative to water service upgrades except for within the development itself.

Sufficient wastewater capacity is available; however, capacity within the conveyance network (the pipes) needs to be confirmed. As with water service, upgrades to the system may be needed; however, no details have been provided outside of the development itself. A state wastewater permit will also be needed prior to construction. **(No finding possible)**

2. The character of the area affected;
The subject property is large at 20+ acres. The character of the area is defined in significant part by the concrete plant that currently occupies the site. The Centennial Woods natural area lies to the west across Grove Street, and Gorge Island lies to the east within the Winooski River. A small residential development consisting of 12 single family residences and a tri-plex lies to the south (built by the same owner of this project), and to the north are residential properties along Grove Street containing a mix of single family, duplex, and multi-family homes.

This criterion calls for consideration of the character of the area as defined by the purpose of the zone within which the project is located. This project is located in the Residential Low Density zone. The purpose statement as articulated in the CDO is as follows.

Sec. 4.4.5 Residential Districts *(emphasis added)*
(a) Purpose:
The Residential Districts are intended to control development in residential districts in order to create a safe, livable, and pedestrian friendly environment. They are also intended to create an inviting streetscape for residents and visitors. Development that places emphasis on architectural details and form is encouraged, where primary buildings and entrances are oriented to the sidewalk, and historic development patterns are reinforced. Parking shall be placed either behind, within, or to the side of structures, as is consistent with the district and/or the neighborhood. Building facades designed for parking shall be secondary to the residential aspect of a structure.

The 5 Residential districts as illustrated in Map 4.4.5-1 are further described as follows:
1. The **Residential Low Density (RL)** district is intended primarily for low-density residential development in the form of single detached dwellings and duplexes. This district is typically characterized by a compact and cohesive residential development pattern reflective of the respective neighborhoods' development history.

The proposed development is far off the mark for the express intent of the city's Residential Low Density zone. Although some changes have been made since the original sketch plan, the proposal continues to consist entirely of exceptions to the rule and in no way embraces the purpose of the RL district. There are no single family homes or duplexes to form the basis of a cohesive residential neighborhood. As stated throughout sketch plan review and again at DAB for preliminary plat, large multi-family buildings may be included in the proposed PUD but they cannot be the entirety of it. Removal of the nonconforming concrete plant and replacement with a nonconforming residential development is unacceptable. **(Adverse finding)**

3. Traffic on roads and highways in the vicinity;
A comprehensive traffic analysis has been provided. Not surprisingly, anticipated traffic generation is significant – 125 AM peak hour trip ends and 154 PM peak hour trip ends. This traffic will be in place of the existing 61 AM peak hour trip ends and 61 PM peak hour trip ends at the concrete plant.

Eight intersections are included in the traffic analysis. Five of them are in Burlington: Riverside Ave/Colchester Ave/Mill St, Riverside Ave/Barrett St, Colchester Ave/Barrett St, Barrett St/Chase St., and Grove St/site access. Only the Barrett St/Chase St and Grove St/site access intersections are not signalized. Despite an increase in vehicle trips, the traffic analysis found that none of the

intersections would experience a drop in level of service (LOS) as a result of the project, either in the AM, PM, or overall LOS. Two of the intersections, Riverside Ave/ Barrett St and Colchester Ave/Barrett St experience LOS F in the PM peak hour and will continue to.

The analysis also examined the access point into the development from Grove Street. It found that stopping and corner sight distances are acceptable and that no exclusive left-turn lane into the project from Grove Street is warranted.

A number of pedestrian improvements are also noted in the traffic analysis. They include sidewalk extensions, new and improved crosswalks, and new signage.

The traffic analysis recommends incorporation of all of the pedestrian improvements. It also makes recommendations relative to intersection signalization, signage, and payment towards improvements at the Colchester Ave/Barrett St/Riverside Ave intersection. The Department of Public Works has reviewed and commented on the traffic analysis. Additional information relative to transportation for school children and the elderly is requested. Clarification is also sought relative to some of the traffic study numbers, particularly as related to queue lengths and turning lane warrant analysis. The final plat application must address Public Works' comments and articulate the extent of traffic mitigation measures that will actually be implemented. **(Affirmative finding if conditioned)**

4. Bylaws then in effect;
As noted in these findings, the application does not fully comply with applicable city bylaws. **(Adverse finding)**

5. Utilization of renewable energy resources;
The project will not utilize renewable energy resources. Utilization of such energy resources remains possible in the future. **(Affirmative finding)**

6. Cumulative impacts of the proposed use;
While this project is very large, this criterion stipulates that the cumulative impact of housing, where it is allowed, be considered negligible. **(Affirmative finding)**

7. Functional family;
There is no request to exceed the 4-unrelated adult occupancy limit in any of the proposed dwelling units. **(Affirmative finding)**

8. Vehicular access points;
See Sec. 6.2.2 (i).

9. Signs;
No signage is included in this proposal. Signs will require separate zoning permits.

10. Mitigation measures;
The proposed residential development will likely not generate offsite noise or glare substantial enough to require mitigation. **(Affirmative finding)**

11. Time limits for construction;

No time limits for construction have been specified. Given the very large size of the project, a build-out/phasing plan is anticipated. This build-out/phasing plan must be included with the final plat application. Alternatively, project construction will be limited to 2 years. **(Affirmative finding if conditioned)**

12. Hours of operation and construction;
Hours of operation need not be specified for this residential development.

In light of the nearby residential properties, hours of construction must be specified and may be limited by the Development Review Board. No hours of construction have yet been specified and must be with the final plat application. **(Affirmative finding if conditioned)**

13. Future enlargement or alterations;
In the event of future enlargement or alteration, permits would be required and reviewed under the regulations then in effect.

14. Performance standards;
Performance standards relating to outdoor lighting and erosion control are addressed under Article 5 of these findings.

15. Conditions and safeguards;
No conditions are proposed.

(b) Major Impact Review Standards
1. Not result in undue water, air, or noise pollution;
Stormwater management details have been provided. Stormwater will be handled onsite with no use of the city's separate or combined sewer systems. Stormwater will be captured and conveyed into a stormwater pond for treatment prior to discharge into the Winooski River. The design also includes several areas onsite for stormwater infiltration into the ground. These infiltration sites will result in volumetric reductions and improved water quality. Final review and approval of the stormwater system from the Conservation Board and the Stormwater Administrator is required. It also bears noting that a State of Vermont stormwater permit will also be required.

As the proposed use is exclusively residential, no significant air or noise pollution is anticipated. **(Affirmative finding if conditioned)**

2. Have sufficient water available for its needs;
See Sec. 3.5.6 (a) 1.

3. Not unreasonably burden the city's present or future water supply or distribution system;
See Sec. 3.5.6 (a) 1.

4. Not cause unreasonable soil erosion or reduction in the capacity of the land to hold water so that a dangerous or unhealthy condition may result;
An erosion prevention and sediment control plan has been provided. As with the post-construction stormwater management plan, it will be subject to final review and approval by the Stormwater Administrator. **(Affirmative finding if conditioned)**

5. Not cause unreasonable congestion or unsafe conditions on highways, streets, waterways, railways, bikeways, pedestrian pathways or other means of transportation, existing or proposed;
See Sec. 3.5.6 (a) 3.

6. Not cause an unreasonable burden on the city's ability to provide educational services;
The proposed development may attract families with school age children. No estimate has been provided as to the anticipated number of school age children, and no comment from the Burlington School Department has been provided. Typically, a correlation exists between dwelling unit types and the number of school age children. Detached single family homes tend to attract the highest proportion of families with school age children, and smaller 1 and 2-bedroom apartment units tend to attract proportionally fewer school age children. The proposed apartments will all be 1 and 2-bedroom units. Impact fees will be paid to help offset impacts to the school system. **(Affirmative finding if conditioned)**

7. Not place an unreasonable burden on the city's ability to provide municipal services;
The proposed development will generate additional impacts on city services. Review and comment by the Departments of Public Works, Fire, Parks & Recreation, Schools, and Burlington Electric has been solicited. Comments received have generally sought additional information or clarification. None asserted unreasonable impacts. **(Affirmative finding)**

8. Not have an undue adverse effect on rare, irreplaceable or significant natural areas, historic or archaeological sites, nor on the scenic or natural beauty of the area or any part of the city;
See Sec. 6.2.2.

9. Not have an undue adverse effect on the city's present or future growth patterns nor on the city's fiscal ability to accommodate such growth, nor on the city's investment in public services and facilities;
The proposed development will replace a large nonconforming industrial use in this residential zone with a new residential use. While the area is not an identified growth center, the area is zoned residential, and residential development in this area is conceptually appropriate. The development is large enough that it will require upgrades to existing city infrastructure. These upgrades will be at the expense of the applicant. **(Affirmative finding)**

10. Be in substantial conformance with the city's municipal development plan;
Several aspects of the proposed development are in conformance with the Municipal Development Plan; however, the development cannot be found to be in substantial conformance.

The development will replace a nonconforming industrial use with residential units in a residential zone (City of Neighborhoods, pg. I-24). It will also leave much of the Winooski River shoreline and onsite wetlands undisturbed (City Policies, pg. II-1). The development will also provide inclusionary housing units (City Policies, pg. IX-1); however, doing so is required by the Comprehensive Development Ordinance.

The proposed development is largely incompatible with the MDP's Land Use, and Built Environment chapters.

The application seeks to utilize multiple density bonuses to achieve the proposed 247 dwelling units; however, the project is not located within any designated growth center wherein new and

higher density development is targeted (Land Use Policies, pg. I-2). The proposed density takes the form of multiple large and larger apartment buildings that do not support and strengthen established neighborhood land use and design patterns (City of Neighborhoods, pg. I-24). The proposed 6-, 9-, and >30-unit apartment buildings do not maintain the existing neighborhood proportions of mass and scale (City Policies, pg. III-1) and the interior streetscape lacks cohesiveness (Streetscape Design, pg. III-7). **(Adverse finding)**

11. Not have an undue adverse impact on the present or projected housing needs of the city in terms of amount, type, affordability and location;
The proposed development will not adversely impact the housing needs of the city. It will provide 247 single and two-bedroom dwelling units. The proposed housing types are largely homogenous in the form of apartment buildings, and the location for such intensity is inappropriate; however, these items do not present an undue adverse impact on the city's housing needs. Inclusionary housing units will be provided as required. **(Affirmative finding)**

12. Not have an undue adverse impact on the present or projected park and recreation needs of the city.
Modest impacts on the city's park and recreation needs are anticipated. Payment of impact fees will help offset such impacts. In addition, the applicant has worked with the Department of Parks & Recreation to agree on a series of improvements related to the Schmanska Park parking lot and access thereto. The improvements would be as articulated in the December 20, 2013 memo from Jesse Bridges to DRB c/o Scott Gustin. **(Affirmative finding if conditioned)**

Article 4: Maps & Districts
Sec. 4.4.5, Residential Districts:
(a) Purpose
(1) Residential Low Density (RL)
The subject property is located in the RL zone. This zone is primarily intended for low density residential development in the form of single family homes and duplexes. The application contains no single family homes or duplexes or anything close to them. Multi-family buildings may be allowed via the PUD process; however, the development must comply with the intent of the RL zone. As proposed, it does not. **(Adverse finding)**

(b) Dimensional Standards & Density
The proposal contains 247 residential units. The total combined property size is now noted as 20.79 acres. This figure is ~11 acres smaller than noted in sketch plans. A small 0.8 acre portion of property will be conveyed to the neighboring residential development to the south. The rest of the discrepancy needs to be explained. Assuming that 20.79 acres is correct, 146 dwelling units could be constructed per the base density of 7 units per acre in the RL zone. Given the size of the development (i.e. more than 5 units), inclusionary zoning applies. Inclusionary zoning provides for an additional 25%, or 8.75 units per in this case (182 dwelling units). The buildable area of the site is just 14.93 acres and limits density (with inclusionary housing) to 131 dwelling units. Density bonuses are included in this proposal as noted in Sec. 4.4.5 (d) 7 below.

Lot coverage is limited to 35% (with an additional 10% available for decks, patios, and open porches). Lot coverage bonuses are available that could increase the 35% allowance up to 50%. As proposed, lot coverage will be 31.2%. It is unclear whether this figure is based on the buildable area (it needs to be).

Front yard setbacks are based on the average of neighboring properties along the same street. In this case, the front yard setback is 14' +/- 5'. The 9-unit apartment building along Grove Street complies with this setback. Side yard setbacks are 10% of the lot width, up to 20', which is depicted on the site plans. The rear property line is defined by the Winooski River. As a result, a waterfront setback applies. This setback is 75' from the ordinary high water mark. The nearest building to the river is about 190' away.

Proposed building heights vary. The tallest building is 53' high. The standard height limit is 35'; however, exceptions may apply as noted under Sec. 5.2.6, *Building Height Limits*. **(No finding possible)**

(c) Permitted & Conditional Uses
The major PUD is subject to conditional use review in the RL zone.

(d) District Specific Regulations
1. Setbacks
No setback encroachments are sought.

2. Height
Not applicable in RL.

3. Lot Coverage
No lot coverage exceptions are sought.

4. Accessory Residential Structures and Uses
The proposed office/clubhouse building is accessory to the residential development. As such it is subject to the dimensional and design review requirements of the CDO. **(Affirmative finding)**

5. Residential Density
All of the proposed residential units are subject an occupancy limit of 4 unrelated adults or a family as defined in the CDO. **(Affirmative finding if conditioned)**

6. Uses
Not applicable.

7. Residential Development Bonuses
The applicant is seeking a residential conversion bonus under item D of this criterion. This bonus allows for a maximum of 8 dwelling units/acre for the conversion of a nonresidential use (in this case, a concrete plant) to a residential use subject to two criteria: 1) The structure shall not have previously been converted from a residential use to a nonresidential use. The concrete plant has never been residential. 2) The structure proposed for demolition shall not be listed or eligible for listing on the National or Vermont Register of Historic Places. The concrete plant is not historically significant.

The project, due to the number of proposed dwelling units (i.e. more than 5), is also subject to inclusionary zoning requirements. As a result, a base density of 8.75 dwelling units per acre

applies. Inclusionary housing, while a requirement under Article 9, is also a bonus under this section of the ordinance.

These two bonuses added together result in a density limit of 16.75 units per acre and are under the limits noted in Table 4.4.5-8, *Maximum Density, Lot Coverage and Building Heights with Bonuses*. Based on the buildable area of 14.93 acres, 250 dwelling units is the maximum potential density. This bonus is discretionary and is subject to conditional use review by the DRB. As noted in these findings, the proposed development is wholly out of character with existing residential neighborhoods in the area and with the express intent of the RL zone. It is incongruous to incentivize a project entirely out of character with its surroundings when so much of the CDO and the MDP call for compatibility with, and strengthening of, the existing built environment. The density bonus should be not be supported given the present form of the proposal. **(Adverse finding)**

Sec. 4.5.4, Natural Resource Protection Overlay (NR) District
(c) District Specific Regulations: Riparian and Littoral Conservation Zone
The subject property is affected by the Riparian and Littoral Conservation Zone for a 250' swath along the length of the Winooski River. This overlay zone also parallels Centennial Brook 100' wide on both sides. The project includes removal of a culvert that creates a choke point on Centennial Brook and will likely benefit the waterway and the wildlife using it. However, neither overlay is depicted on the project plans as required, nor is there any assessment of project impacts relative to the applicable criteria. Sketch plan comments noted that information to address this criterion would be needed at preliminary plat. None has been submitted. **(No finding possible)**

(d) District Specific Regulations: Wetland Conservation Zone
The subject property contains extensive wetlands, particularly to the northeast. This overlay includes the wetlands and their associated 100' wide buffer zone. The project plans depict the wetlands but not their buffer zone and must. Scaling the wetland boundary and the associated 100' buffer zone indicates that the furthest southeastern parking area will encroach into the wetland buffer zone. While development within the buffer zone may be allowed, there is no assessment of impacts per the applicable criteria as required. Alternatively, the parking area may be adjusted out of the buffer zone. As with above, sketch plan comments noted that information to address this criterion would be needed at preliminary plat. None has been submitted. **(No finding possible)**

(f) District Specific Regulations: Special Flood Hazard Area
The subject property contains flood plain areas along the Winooski River affected by the special flood hazard area (SFHA). It appears that development will remain out of the SFHA, but the overlay boundaries are not depicted as required. These boundaries must be included on the final plat plans. If any development does encroach into the SFHA, the application must address the applicable review criteria. As noted above, sketch plan comments noted that information to address this criterion would be needed at preliminary plat. None has been submitted. **(No finding possible)**

Article 5: Citywide General Regulations
Sec. 5.2.3, Lot Coverage Requirements
See Sec. 4.4.5 (b) above.

Sec. 5.2.4, Buildable Area Calculation

As the subject property is located within the RL zone and is greater than 2 acres in size, this criterion applies. The preliminary plat plans depict areas of wetlands and steep slopes (15% - 30% and 30% +). The resultant buildable area is 14.93 acres. **(Affirmative finding)**

Sec. 5.2.5, Setbacks
See Sec. 4.4.5 (b) above.

Sec. 5.2.6, Building Height Limits
(b) Exceptions to Height Limits, 1
This criterion allows (permissive, not prescriptive) for new construction to exceed the 35' height limit within parcels containing an existing structure exceeding 35' as of January 1, 2008. A portion of the concrete plant contains a structure of 57' tall that has been in place since before January 1, 2008. The subject structure is immediately adjacent to Grove Street and would either be donated to the city as bicycle and pedestrian rest area or it would be removed.

All of the >30-unit apartment buildings appear to exceed 35' in height, and the tallest is 53' tall. Utilization of this provision to enable multiple very large, out-of-character apartment buildings in the RL zone is unwarranted, particularly if the "enabling" concrete structure is removed. **(Adverse finding)**

Sec. 5.2.7, Density and Intensity of Development Calculations
See Sec. 4.5.5 above.

Sec. 5.5.1, Nuisance Regulations
Nothing in the proposal appears to constitute a nuisance under this criterion. **(Affirmative finding)**

Sec. 5.5.2, Outdoor Lighting
New outdoor lighting will consist of pole-mounted fixtures for parking and circulation areas, and wall-mounted fixtures for building entries. The locations are depicted on project plans, and the proposed lights are acceptable cut-off fixtures. A photometric plan was submitted at the DAB's November 12 meeting; however, its 11" X 17" size makes it effectively illegible. The Calculation Summary table notes walkway lighting levels that exceed the 0.5 average requirement under the lighting standards of this section. The "paved" illumination levels are acceptable if they pertain to parking and circulation areas. Revisions and improved legibility will be required for final plat review. **(Affirmative finding if conditioned)**

Sec. 5.5.3, Stormwater and Erosion Control
As noted previously, stormwater will be handled onsite and consists generally of collection and direction of runoff into a detention pond and also includes provision for infiltration. An erosion control plan has also been provided. Both items are subject to final review and approval by the Stormwater Administrator with input from the Conservation Board. **(Affirmative finding if conditioned)**

Article 6: Development Review Standards:
Part 1, Land Division Design Standards
Sec. 6.1.2, Review Standards
Two large parcels and part of a third will be merged together. The proposed changes are shown on some, but not all, of the project plans. Plans must depict consistent property boundaries

throughout. While a survey is not required at preliminary plat, the preliminary plans must nonetheless show exact boundary lines. A boundary survey by a VT licensed land surveyor must be provided prior to final plat review. **(Affirmative finding if conditioned)**

Part 2, Site Plan Design Standards
Sec. 6.2.2, Review Standards
(a) Protection of important natural features
Two natural resource overlays affect the property:
1) Riparian and Littoral Conservation Zone
2) Wetlands Conservation Zone

The proposed development appears to be out of the riparian and littoral conservation zone along the Winooski River but will impact some of it along Centennial Brook. The project plans do not include these overlays and they must be provided in order that the extent of impacts can be clearly discerned. An impact analysis per Sec. 4.5.4 (c) must be provided. Much of the work along Centennial Brook will actually result in an improvement by removing a driveway and culvert and restoring the brook to an open channel.

The wetlands are depicted on the project plans. Development is not within the wetlands, but there is some encroachment into the 100' wetland buffer by a new surface parking lot at the southeastern end of the site. There is ample room to reconfigure this parking lot. Alternatively, a wetland impact analysis per Sec. 4.5.4 (d) is required.

Lastly, wooded areas around the periphery of the construction site will remain intact. **(No finding possible)**

(b) Topographical alterations
Substantial grading and filling is proposed; however, it will be limited to existing disturbed areas. The overall topography of the site will remain generally as it exists. **(Affirmative finding)**

(c) Protection of important public views
There are no important public views from or through the property. **(Affirmative finding)**

(d) Protection of important cultural resources
The property is not included in the city's map of archeologically sensitive areas (in the Open Space Protection Plan); however, its location along the Winooski River increases the likelihood that prehistoric artifacts may be present. As part of due diligence, the applicant is advised to contact the Vermont Division for Historic Preservation to inquire as to studies of the area that may indicate heightened archaeological significance. If, during construction, artifacts are unearthed, it is the applicant's responsibility to stop earthwork and to contact the Division for further guidance. **(Affirmative finding if conditioned)**

(e) Supporting the use of alternative energy
No apparent alternative energy is incorporated into the project design. Given the significant roof area, clear southern exposure, and the opportunity for economy of scale, the applicant is strongly encouraged to include rooftop solar into the project design. **(Affirmative finding if conditioned)**

(f) Brownfield sites

The property is included on the Vermont DEC Hazardous Site List. The listing indicates that diesel and heating oil contamination were found but also notes that Site Management Activities were completed in 1999. **(Affirmative finding)**

(g) Provide for nature's events
A stormwater management system is proposed. The system includes a number of catch basins and pipes used to collect stormwater runoff and direct it into an onsite "wet" pond for attenuation. Stormwater will ultimately discharge into the Winooski River. Existing discharge points into Centennial Brook will be eliminated. The stormwater system takes advantage of the sandy soils and makes use of several infiltration locations to reduce stormwater volumes. Final details for the proposed stormwater management system will be required prior to final plat approval.

A comprehensive erosion prevention and sediment control plan has been provided. As with the stormwater management, final details will be required prior to final plat approval.

Several areas for snow storage are interspersed throughout the site. **(Affirmative finding if conditioned)**

(h) Building location and orientation
The proposed development is large enough that it will essentially result in the establishment of a new neighborhood. The visible public streetscape along Grove Street is an important component; however, equally important is the establishment of a well-defined built environment, functional open spaces, and interconnectivity between these components within this new neighborhood.

The proposed buildings along Grove Street are placed fairly close to the road. Further into the development, all of the buildings face parking areas. As noted in criterion (l) below, most of this parking should be placed behind the buildings. Front entries are obvious, and insofar as there are interior "roads," the entries face them. Generally, the buildings are parallel to the interior roads; however, the community center building is not. This building is set at about 45 degrees. Rotating it to 90 degrees would enforce the corner; however, the Design Advisory Board was ambivalent as to its orientation.

As recommended in sketch plan review, the very large apartment buildings have been pushed further back into the development; however, opportunity remains to introduce more, smaller buildings into the project design to better reflect the intent and purpose of the Residential Low Density zone. Per Sec. 4.4.5 (a), the RL zone is "…intended primarily for low density development in the form of single detached dwellings and duplexes. This district is characterized by a compact and cohesive residential development pattern reflective of the respective neighborhood's development history." **(Adverse finding)**

(i) Vehicular access
One existing curb cut will be removed to allow for restoration of the Centennial Brook channel. Doing so will leave one curb cut to serve the development. Adequacy of access has been conceptually approved by the Fire Marshal, and final approval will be required prior to final plat approval. Sight lines and turning radii will be subject to review and approval by the Department of Public Works. **(Affirmative finding if conditioned)**

(j) Pedestrian access

All proposed buildings have front walkways that connect to the walkway network throughout the development. This interior walkway network connects to the public sidewalk along Grove Street. This public sidewalk will be extended into South Burlington as part of this development. The apartments immediately along Grove Street lack front walkways out to the Grove Street sidewalk and present only faux front entries to the street. The "entries" are in appearance only and do not actually serve as entries. This deficiency was corrected in the November 26 plans; however, the applicant has reverted to the November 12 plans.

It is noted on the plans that the proposed city sidewalk does not extend across the access driveway, but appears only painted stripes across the asphalt. This is not acceptable, and the concrete city sidewalk must be continuous across the driveway.

Pedestrian routes from parking areas are depicted on the project plans. **(Adverse finding)**

(k) Accessibility for the handicapped
Handicap parking spaces are depicted on the site plans. The buildings will require handicap accessible features per the ADA as administered through the city's building code. **(Affirmative finding if conditioned)**

(l) Parking and circulation
Parking will be provided underneath the 6 largest buildings, along the interior streets, and in surface parking lots. This criterion requires that parking be placed at the side or rear of the property to the extent possible and screened from view from surrounding properties and adjacent public streets. The proposed development area is very large, and there is ample room to shift parking spaces and building locations. While some parking in front of the buildings may be acceptable, particularly as parallel "on street" parking, most of it must be located underneath or behind the buildings. There is opportunity here to create interior streetscapes like those so common in other Burlington neighborhoods. Emphasis needs to be placed on creating a well-defined, inviting streetscape. Parking needs to be secondary and screened from view.

This criterion also requires shading of surface parking areas. A 30% shading objective is articulated. The parking areas include a number of trees; however, no shading details are yet provided and must be. **(Adverse finding)**

(m) Landscaping and fences
A comprehensive landscaping plan has been provided and includes 146 new trees, 507 shrubs, and 780 perennials. The trees basically line all of the parking and circulation drives. There is opportunity to create more of a street tree layout with repositioned parking as noted in criterion (l) above. Thirteen of the new trees are proposed along Grove Street and are subject to review and approval by the City Arborist. Generally, the proposed landscaping is used to provide boundaries between interior spaces and to soften transitions between buildings and pavement. Split rail fencing will be installed to follow the eastern "ridgeline" along the clearing boundaries of the site. It too will provide a boundary between the developed and wooded portions of the property. **(Affirmative finding if conditioned)**

(n) Public plazas and open space
Substantial open space will be available for use by residents of the development. Two large center greens are proposed and may be used for active or passive recreation. The clubhouse and

community pool are located in the northern green. A pavilion is depicted in the southern green. Access to trails will be provided and will afford access into the wooded portions of the property. No children's play areas or other recreational facilities (such as basketball courts) are evident and should be incorporated into the design. Several small community garden sites may also be appropriate. The applicant is encouraged to consider the creation of multiple pocket parks, patios, and/or pavilion areas defined with hardscaping (i.e. pavers, walls, benches, etc.) and landscaping. **(Affirmative finding if conditioned)**

(o) Outdoor lighting
See Sec. 5.5.2.

(p) Integrate infrastructure into the design
Substantial new infrastructure will be required to support the proposed development. A utility plan and details sheet have been provided. All utility lines must be buried. Several dumpster pad locations are evident on the site plan; however, no details are provided. The dumpsters must be enclosed for screening purposes. No mail box locations are evident either. If any exterior "gang boxes" are proposed, they must be designed to relate to the surrounding buildings. They cannot be unadorned grey metal boxes on poles. No ground-mounted mechanical equipment (such as HVAC or electrical "hot boxes") details have been provided and must be. **(No finding possible)**

Part 3, Architectural Design Standards
Sec. 6.3.2, Review Standards
(a) Relate development to its environment
1. Massing, Height, and Scale
Three residential building types are proposed for the 6-unit, 9-unit and 30+ unit buildings. A clubhouse building and pavilions are also proposed. No elevation drawings of the pavilion structures have been provided and must be.

This project is a planned unit development, and therefore, may include multi-family buildings. However, as explicitly stated in this criterion, the most important considerations when evaluating the compatibility of in-fill development in the RL zone are the height and massing of existing buildings in the vicinity. The residences along Grove Street to either side of this proposed development consist of single family and multi-family homes, all of moderate size. The proposed buildings in this new development are all substantially larger than neighboring homes. This criterion allows for dissimilar development but calls for a sensitive transition. The proposed development attempts to provide this transition by placing the smaller buildings along Grove Street and placing the very large buildings further into the site. The problem is that the massing, height, and scale of even the smallest 6-unit buildings are much greater than those of the neighboring residences. A much more context sensitive transition could be provided by locating smaller scale 2- and 3- family homes along Grove Street with a gradual transition in unit type and intensity further into the development. Generally, additional smaller buildings and fewer large buildings would be appropriate in this Residential Low Density zone. As with the sketch plans, this proposal contains large and larger buildings.

As for the building elevations, the 6-unit and 9-unit buildings successfully read as large homes. They effectively utilize fenestration, porches, dormers, and other architectural details to provide intricacy to these fairly large buildings. There is some variation amongst their design. The large 30+ unit buildings incorporate a variety of porches, balconies, varying materials, and

architectural details to avoid any large expanses of undifferentiated building mass. The buildings also appear more vertical than horizontal as required by this criterion. All six of these buildings, however, are identical. Although not explicitly required by this criterion, some differentiation amongst these buildings should be incorporated into the project design.

The clubhouse building is a relatively low-slung gable-roofed structure with a fairly innocuous design. It is not a residence and should not read as such; however, as proposed, the building clearly reads more horizontal than vertical. The wide roof mass and the relatively short exterior walls contribute to this perception. More vertical emphasis should be placed on the building design as required by this criterion. **(Adverse finding)**

2. Roofs and Rooflines
The 6- and 9-unit building types incorporate hip roof designs with roof dormers to enable living space. The proposed roof type is typical of residential development. The larger buildings contain gable roofs. Differing planes and gables contribute to breaking up the massing of these very large apartment buildings. As noted above, the clubhouse building includes a gable roof. **(Affirmative finding)**

3. Building Openings
Proposed fenestration in the 6- and 9-unit building types is typical for residential development and appears to consist primarily of double hung windows with grilles and shutters applied in a consistent pattern. There is more variation in the larger apartment buildings. That variation helps to define individual components within the very large structures. The clubhouse includes fenestration unique within the development. This uniqueness appropriately helps to differentiate it from the residential buildings. **(Affirmative finding)**

(b) Protection of important architectural resources
Buildings within the existing concrete plant are not historically significant. Their demolition will not adversely impact any important architectural resources. **(Affirmative finding)**

(c) Protection of important public views
See 6.2.2 (c) above.

(d) Provide an active and inviting street edge
The proposed development is large enough to amount to the creation of a new residential neighborhood. As currently proposed, there is little definition of street edge due in no small part to widely spaced building and the abundance of surface parking in front of them. An interior street network lined with close-set buildings should be created. The placement of most parking underneath or behind the buildings will afford much greater opportunity for an inviting street edge environment among the buildings, sidewalks, roads and interior green spaces. The buildings themselves contain clearly defined entries and pedestrian-friendly elements such as front porches, walkways, differentiated facades. **(Adverse finding)**

(e) Quality of materials
Exterior building materials consist largely of varying types of vinyl siding. Some brick veneer will be utilized on the largest apartment buildings and stone veneer along the foundation of the clubhouse. Composite trim will be installed along with asphalt shingle roofing. Railings will be metal, and clad windows will be installed. This criterion states that "all development shall

maximize the use of highly durable building materials that extend the life cycle of the building, and reduce maintenance, waste, and environmental impacts." Vinyl siding is not especially durable, and has a short lifecycle when compared to other materials; however, the Design Advisory Board felt that vinyl may be acceptable depending on installation details. No such details have been provided and must be prior to final plat approval. **(Affirmative finding if conditioned)**

(f) Reduce energy utilization
There is no information relative to energy efficiency of the proposed buildings. At a minimum, the buildings must comply with the city's current energy efficiency requirements. **(Affirmative finding if conditioned)**

(g) Make advertising features complimentary to the site
No advertising features are included in the proposal. Signs are subject to subject zoning permit review. **(Affirmative finding if conditioned)**

(h) Integrate infrastructure into the building design
No building mounted mechanical equipment or meters are noted on the elevation plans. Any such items must be clearly depicted and screened on the project plans. Any rooftop equipment that results in exceeding the applicable height limits must be incorporated into an architectural feature as part of the overall project design. They may not simply be placed atop the roofs. Mail boxes for these multi-family homes need consideration. The plans do not address how these will be handled. Any gang mailboxes would need to be boxed in with materials that match the proposed buildings. **(No finding possible)**

(i) Make spaces safe and secure
Building entries will be illuminated, and the buildings should have intercom systems to maximize personal safety of the tenants. As noted previously, the adequacy of single site access must be confirmed by the Fire Marshal. **(Affirmative finding if conditioned)**

Article 8: Parking
Sec. 8.1.8, Minimum Off-Street Parking Requirements
The subject property is located in the neighborhood parking district. As a result, each dwelling unit requires 2 parking spaces – a total of 494 parking spaces in this case. As proposed, 500 parking spaces are included (204 underground and 296 surface). **(Affirmative finding)**

Sec. 8.2.5, Bicycle Parking Requirements
Bicycle parking details are lacking. There is only a statement in the application noting the required number of long and short term spaces, that they will be provided, and that details will be delivered at final plat. This project requires 72 long term spaces and 29 short term spaces. Bike parking details relative to amount, type, and form must be included in the final plat application. **(Affirmative finding if conditioned)**

Article 9: Inclusionary and Replacement Housing
Sec. 9.1.5, Applicability
As the proposed development includes more than 5 new dwelling units, it is subject to the inclusionary housing provisions of this Article. Fifteen percent of the total unit count must be inclusionary (15% of 247 is 37 dwelling units). The application notes that these 37 inclusionary

units will be provided. Final details as to location and level of affordability must be worked out with the city's Housing Trust Fund prior to final plat approval. **(Affirmative finding if conditioned)**

Article 10: Subdivision
There is no apparent subdivision of land included in this proposal. A 0.8 acre lot line adjustment is included with the abutting residential property to the south. As a major PUD, a boundary survey done by a VT licensed surveyor must be completed with the final plat application. **(Affirmative finding if conditioned)**

Article 11: Planned Unit Development
Sec. 11.1.6, Approval Requirements
(a) Lot coverage requirements of the district shall be met
The coverage limit is 35% in the RL zone, but may reach 50% with bonuses. The plans note 31.2% coverage, but it is not clear that that figure is based on just the buildable area. **(No finding possible)**

(b) The minimum setbacks required for the district shall be met
As noted previously, front, side and waterfront setbacks are compliant. **(Affirmative finding)**

(c) The minimum parcel size shall be met if the project is located in a RL or RL-W district
The two acre minimum lot size requirement for PUD has been met. **(Affirmative finding)**

(d) The project shall be subject to design review and site plan review of Article 3, Part 4
See Article 3 above.

(e) The project shall meet the requirements of Article 10 for subdivision review
See Article 10 above.

(f) All other dimensional, density, and use requirements of the underlying zoning district shall be met as calculated across the entire property
Building heights exceed the 35' limit. The application references Sec. 5.2.6 (b) which allows for new building heights to match existing nonconforming building height on the property. The application also contemplates demolishing the existing nonconforming building. As noted previously, utilization of this provision to enable six very large, tall apartment buildings in the RL zone is unwarranted, particularly if the existing structure enabling the excess height is demolished. **(Adverse finding)**

(g) Open space or common land shall be assured and maintained in accordance with the conditions as prescribed by the DRB
Significant open space will remain; however, no information has been provided with respect to the maintenance of common lands. At least general information relative to this criterion is needed at preliminary plat. **(No finding possible)**

(h) The development plan shall specify reasonable periods within which development of each phase of the planned unit development may be started and shall be completed. Deviation from the required amount of usable open space per dwelling unit may be allowed provided such deviation shall be provided for in other sections of the planned unit development.

No build-out/phasing schedule has been provided and should be given the multiple building concept and size of the project. Otherwise, a 2-year time frame will apply to the permit. **(Affirmative finding if conditioned)**

(i) The intent as defined in Sec. 11.1.1 is met in a way not detrimental to the city's interests

Sec. 11.1.1, Intent

(a) Promote the most appropriate use of land through flexibility of design and development of land;

Removal of a nonconforming industrial use and replacement with residential development is conceptually appropriate. The form that this development has taken, however, is not the most appropriate use of this land. The most appropriate use of land here via the PUD process would be a very compact residential neighborhood with small lots and/or buildings, narrow setbacks, a network of small streets and some "spice" of varied multi-unit building types and sizes. As noted throughout these findings, the development is wholly incompatible with the express intent of the RL zone. **(Adverse finding)**

(b) Facilitate the adequate and economical provision of streets and utilities;

Multiple residences will be served by shared streets and utilities within the development. Construction of the residences and supporting infrastructure is included in the same development. **(Affirmative finding)**

(c) Preserve the natural and scenic qualities of open space;

Open space will remain, and much of it will contain protected natural features like wetlands and riparian corridors. **(Affirmative finding)**

(d) Provide for a variety of housing types;

There is relatively little variety of housing types included in this proposal. All are 1 and 2-bedroom rental units and all are included in multi-family apartment buildings. Variety is limited to the sizes and form of the apartment buildings. This limited variety misses the basic ingredients of a new low density residential neighborhood – single families, duplexes, and even triplexes. **(Adverse finding)**

(e) Provide a method of development for existing parcels which because of physical, topographical, or geological conditions could not otherwise be developed; and,

Not applicable. The subject property does not need to be developed as a PUD, but it may be.

(f) Achieve a high level of design qualities and amenities.

Lack of appropriate, context-sensitive design is the fundamental problem with this proposal. Significant amenity in the form of common open spaces, river access, club house, and pavilion areas will be provided. **(Adverse finding)**

(j) The proposed development shall be consistent with the Municipal Development Plan

See Sec. 3.5.6 (b) 10.

II. Reasons for Denial

Per the "adverse finding" and "no finding possible" criteria above.

October 27, 2013

Scott Gustin, Senior Planner
Austin Hart, Chairman, Development Review Board
Department of Planning and Zoning
149 Church Street
Burlington, VT 05401

Re: Grove Street Apartments, Preliminary Plan application

Dear Scott, Austin and DRB members,

In accordance with the COA Level III Preliminary Plat Application Checklist submission requirements for this project I offer the following information and materials.

- A completed and signed permit application
- Application fee of $74,110
- 1 full size color, 5 full size black, 1 colored 11x17 and a disc of the following plan set:
  - **T1** – Title Sheet
  - **L1.0** – Tree Planting Plan
  - **L1.1** – Enlarged Planting Plan - Zone 1
  - **L1.2** – Enlarged Planting Plan - Zone 2
  - **L1.3** – Enlarged Planting Plan - Zone 3
  - **L1.4** – Enlarged Planting Plan - Zone 4
  - **L1.5** – Enlarged Planting Plan - Zone 5
  - **S1** – Existing Conditions Plan
  - **S2** – Site Plan
  - **S3** – Utility Plan
  - **S4** – Grading Plan
  - **S5** – Pedestrian Plan 1
  - **S6** – Pedestrian Plan 2
  - **S7** – Pedestrian Plan 3
  - **S8** – Street Sewer Plan & Profile
  - **S9** – Sewer Plan & Profile – Upper
  - **S10** – Sewer Plan & Profile – Transition
  - **S11** – Sewer Plan & Profile – Lower
  - **S12** – Colchester Court Water Plan
  - **S13** – Sewer Details
  - **S14** – Pump Station Details
  - **S15** – Parking Details
  - **S16** – Water Details
  - **S17** – Stormwater and Erosion Control Details
  - **EC1** – Erosion Control Pre-Construction Plan

EC2 – Erosion Control Construction Plan
EC3 – Erosion Control Post-Construction Plan
EC4 – Erosion Control Culvert Removal
A1 – Typical Front Building Elevations A,B,C,D,E,F
A2 – Typical Rear Inside Elevations A,B,C,D,E,F
A3 – Typical Garage Floor Plan A,B,C,D,E,F
A4,A5,A6 – Typical Front, Side, Rear Building Elevations J,K
A7,A8,A9 – Typical Front, Side, Rear Building Elevations I
A10,A11,A12 – Typical Front, Side, Rear Building Elevations G,H
A13,A14,A15 – Typical Front, Side, Rear Building Elevations L
A16,A17,A18 – Typical Exterior

I will be sending you the following studies and or documents via e-mail:

- All applicable draft legal documents for the Common Interest Community.
- A Draft Warranty Deed for the conveyance of a small parcel of land to the city. (Said parcel is further defined in the narrative below)
- A traffic study/ analysis prepared by Resource Systems Group Inc.

Following is a brief narrative describing the proposed projects conformance with each of the applicable review criteria per section 10.1.8, Preliminary Plat Review (d) Review Criteria of the CDO.

This proposal is to replace the concrete plant and ancillary uses with 247 one & two bedroom units and a rental office/club house in 12 buildings. Each building will have a "footprint lot" as depicted on sheet S2. The project is proposed to be built on two existing lots and a portion of a third existing lot as depicted on sheet S2.. The two existing lots are currently occupied by S.D. Ireland Brothers Corp and S.D. Ireland Grove Street Properties LLC and are used for the production of concrete, storage of inventory, maintenance of heavy equipment and offices. The third lot is also owned by S.D. Ireland Grove Street Properties, LLC and we are proposing to take 0.8 acres out of that lot (via a boundary line adjustment). Apple Grove Apartments sits on this lot and currently comprises 16 units of housing. We have completed a density analysis on the remaining portion of this lot and concluded that we are still in compliance with the base density requirement of this district.

The project is proposed to be served by municipal water and sewer. We are also proposing off-site improvements that relate to water, sewer, traffic and pedestrian safety. Since the technical review meeting and the DRB sketch plan meeting we have met with the Ward 1 NPA (three times), the Fire Marshall, Parks & Rec, Public Works, CEDO, the Conservation Commission, the Design Advisory Board, many neighbors, UVM,BED, Efficiency Vermont, Vt. Gas, the City of South Burlington, several staff members from The Agency of Natural Resources and The Act 250 district Coordinator all in an attempt to propose a project that has taken everyone's ideas and concerns into consideration.

Zoning: density, setbacks, lot coverage's:

All dimensional requirements are met. The underlying zoning district is residential and allows a base density of 7 units per acre. The project is subject to Inclusionary Zoning Requirements which bring the base density up to 8.75 units. The project is also eligible for a Residential Conversion Bonus of 8 units per acre, which brings the total potential density to 16.75 units per acre. The maximum allowable density using all applicable density bonuses is 20 units per acre. We are proposing a gross density of 11.8 units an acre and a net density (removal of undevelopable area) of 16.5 units an acre. For a more detailed analysis please refer to table to the right.

Zoning Information

ZONING DISTRICT: RESIDENTIAL - LOW DENSITY

DIMENSIONAL REQUIREMENTS

	REQUIRED	PROPOSED
MINIMUM ROAD FRONTAGE	60'	1,250'
MINIMUM LOT SIZE	10,000 S.F.	1,376,576 SF
MAXIMUM DENSITY	7 UNITS/AC.	N/A
MAX. LOT COVERAGE	35%	31.2%
MINIMUM FRONT SETBACK	AVG. OF 2 ADJACENT LOTS ON BOTH SIDES	14'
MINIMUM SIDE SETBACK*	10% OF LOT WIDTH	>20'
MINIMUM REAR SETBACK**	25% OF LOT DEPTH	>75'
MINIMUM WATERFRONT SETBACK	75'	>75'

*NOT TO EXCEED 20'
**NOT TO EXCEED 75'

Buildable Area Calculation

TOTAL LOT SIZE - 20.79 ACRES (905,395 SQ. FT.)

- LESS PORTIONS OF THE PROPERTY COVERED BY STREAMS, PONDS, LAKES, WETLANDS, AND OTHER BODIES OF WATER, AND LANDS WITH A SLOPE IN EXCESS OF 30%.

SLOPES GREATER THAN 30% - 181,984 SQ. FT.

WETLANDS - 18,945 SQ. FT.

- THE DRB MAY UNDER CONDITIONAL USE CRITERIA ALLOW UP TO 50% OF THE MAXIMUM BUILDING DENSITY OR LOT COVERAGE TO BE CALCULATE ON LANDS WITH A SLOPE BETWEEN 15 - 30%.

SLOPES BETWEEN 15% AND 30% - 105,647 SQ. FT.

TOTAL UNBUILDABLE AREA = 5.86 ACRES (255,253 SQ. FT.)
(181,984 SQ. FT. + 18,945 SQ. FT. + (105,647*50%) = 255,253 SQ. FT.)

TOTAL BUILDABLE AREA - 14.93 ACRES (650,142 SQ. FT.)
(905,395 SQ. FT. - 255,253 SQ. FT. = 650,142 SQ. FT.)

Density Calculation

BASE DENSITY: 8.75 D/U PER ACRE
8.75 D/U/ACRE X 14.93 BUILDABLE ACRES = 130.64 UNITS

RESIDENTIAL CONVERSION BONUS*: 8 D/U PER ACRE
8.00 D/U/ACRE X 14.93 BUILDABLE ACRES = 119.44 UNITS

TOTAL ALLOWABLE DENSITY** = 250.08 UNITS
138 INCLUSIONARY UNITS +
212 MARKET RENT UNITS)

*PER SECTION 4.4.5 (D), TABLE 4.4.5-7. THE SECTION ALSO ALLOWS FOR A MAX. LOT COVERAGE OF 50%.

**PER SECTION 9.19, TABLE 9.19-1 A TOTAL OF 15% OF ALL UNITS ARE REQUIRED TO BE INCLUSIONARY UNITS. THIS PARCEL WOULD THEN ALLOW FOR 38 INCLUSIONARY UNITS AND 212 MARKET RENT UNITS FOR A TOTAL OF 250 RESIDENTIAL UNITS.

Height

We are proposing a maximum height of 53 feet for Building A, which is the only 4 story building proposed. The remainder of the buildings average 43 feet and are three stories with the exception of the rental office/ clubhouse which is proposed to be two stories. The plan sets depict the front, rear and side elevation of the buildings. **Section 5.2.6 (b) Exceptions to Height Limits** paragraph 1 allows the height of a new building to be equal to or less than an existing structure if the existing structure was built prior to January 1, 2008. On this sit there is a pre-2008 mixing plant that abuts Grove Street that is 57 feet high. It is important to note, that building A sits in the lowest portion of the site and the elevation of the roof is proposed to be at 244 feet. The elevation of Grove Street in front of this building is 235 feet so the building will actually only be 9 feet taller than the street. We are proposing to gift this structure and the land surrounding it to the City. We feel, and the Parks & Recreation department concurs that this would be a great place for a bicycle and pedestrian rest area. The location of this structure can be seen on sheets S1 –S4. In the event that the City does not want it we would propose to either leave it in place (unused, or remove it). This section of the ordinance does not say that the existing structure needs to be either used or that hit needs to stay.

Overlay Districts:

The project lands are not impacting any of the Overlay Districts.

Natural Resources:

We feel this project is a big win for the environment. The developable area of the site is currently 95% impervious, we are reducing that to 31.2%. Currently the stormwater from the site has several points where it drains into either Centennial Brook or the Winooski River, we are proposing a state of the art stormwater system which includes the use of multiple rain gardens and are happy to report that we are not proposing to send any stormwater into Centennial Brook or any untreated Stormwater into the Winooski River. The developable area of the site is basically void of trees and grass, we are proposing to plant 146 trees, 507 shrubs and 780 perennials and approximately 10 acres of grass. The site has several hundred feet along the Winooski River and we are not proposing any improvements along that corridor or its buffer. We have delineated the wetlands and floodplains on the site and are not proposing to impact any of them or their associated buffer zones. We have had several staff members from the Agency of Natural Resources on site to review this proposal and confirm the wetland delineation and to search for the presence of irreplaceable natural areas, endangered plants and animals and potential erosion issues and are happy to report that they had no concerns with this project (with one exception as noted below*).

You will see on the plans that we are proposing one entry instead of the two entrances that we showed at Sketch plan. This is due to a request that was made first by the Conservation Commission and then by the Agency of Natural Resources*. Eliminating the second or northern entrance will allow us to remove the existing culvert and associated fill and bring this section of Centennial Brook back to what is referred to as an open channel. This is a very large plus for the brook! In regards to our meeting with the

Conservation Commission, we also added the a split rail fence adjacent to the existing tree line along the majority of the site, as depicted on sheet L1.0.

Fire Protection:

We have met with the Fire Marshall and have taken his concerns into consideration. He has seen our proposal to only have one entrance and that is why the one entrance is separated by a curbed island.

Traffic:

As mentioned, RSG Inc. was commissioned to analyze the traffic that this project will generate. We concur with all of their conclusions with the exception of #23, which recommends that we pay a "fair share contribution of approximately $6,000" to the City for the eventual improvements at the Colchester Avenue/Riverside Avenue/Barrett Street intersection Triangle. We request this because we will be paying approximately $53,600 in Traffic Impact Fees to the City already.

Lighting

Our lighting is divided into three categories: Interior, building mounted exterior and pole mounted exterior. All lighting will conform to both the general and specific (where applicable) lighting standards of the CDO. The landscaping sheets (L1-L5) all depict the street light and parking area pole locations and attached to this narrative are cut sheets that depict the pole, fixture and bulb type. We have not yet determined the exact location of the building mounted lights but we have included the cut sheet for the ones we will be using. All bulbs will be LED (if available) and at the Final Application stage a point by point photometric analysis will be completed and provided.

Site Design & Development Pattern:

One of the things that has been a constant concern is what type of visual or aesthetic impact will this project have on Grove Street? Because of this, we are proposing buildings along Grove Street that imitate large homes, specifically the Allen House on the Corner of South Prospect and Main Street and the Grasse Mont building on Summit Street. While we are not proposing to construct replicas of these buildings we have taken features (front entry way, trim detail and colors) from each and applied them to the elevations. One item that we have yet to decide on and are looking for the DRB and DAB's feedback on is if we should provide (or not) a direct connection to the sidewalk from these houses (I&J) to Grove Street. Currently the plans do not depict that connection due to the thought that if installed the sidewalk would be used as a shortcut to get to the interior of the project and for security reasons we may want to encourage pedestrians to use the sidewalk at the main entrance (as depicted) .

Once inside the project the streetscape is designed to give the project more of an open, campus type look and feel. You will notice that most intersection corners have a gentle radius and sidewalks are set back from the curb, both design concepts allow street trees to be closer to the pavement which enhances the visual appearance and increases the amount of shaded pavement. We have also proposed to not fill the interior of the two green areas in the center of each pod with trees, as our market research indicates that open areas in which people can play frisbee, kick a soccer ball or have a picnic score high on the scale for natural amenities. We have also chosen not to cross either of these open

areas with a sidewalk or improved path. We have however proposed to incorporate an improved trail system throughout the project site. The trails are depicted on the landscape plan and will likely be made up of natural mulch or gravel, or perhaps may simply become a dirt path.

Architectural Design Standards:

As mentioned previously, we are sensitive to how this project will appeal to the existing neighborhood and to the general public as they travel Grove Street and we believe we have come up with a fantastic way to bring some of Burlington's architectural heritage to Grove Street by utilizing a few of the design features and colors from some of Burlington's most historic and visible buildings (that when built, were residences).

It is however important to note that we are financially unable to use the same materials as those buildings as the materials are simply too expensive to purchase, too expensive to install and too expensive to maintain over time, hence the reason we are proposing to use mostly vinyl products on these buildings. We also completed a building by building analysis of the materials used in the neighborhood and can report that 85% of the houses on Grove Street have either metal or vinyl siding and trim and the majority of them have replacement (vinyl) windows and fiberglass doors.

In regards to the massing, height and scale of this project, we understand that once inside this project, it will not look or feel like Grove Street, we do however, feel that this amount of density and the massing, height and scale of this project is the highest and best use of this land. For all of the right reasons: added green space, less pollution from the diesel trucks, less noise from the trucks and plant, less dust, less truck traffic, less impervious surface, the need for housing, a safer street, etc.

Signage:

We are proposing to have a project sign inside the curbed island at the entrance as depicted on sheets L1.0 & L1.2. The sign will likely be large boulder or natural block with the name of the complex engraved within it. It will be lighted by an approved fixture and bulb. Other signs will be directional in nature (ex: Turn right for buildings A, B, & C) and their purpose will only be to enhance the circulation of residents and their visitors. They will be harmonious in color, material and lighting (where necessary) and will conform to Article 7 of the CDO.

Parking:

We do not need to request a waiver from the parking standards. The requirement is 2 spots for each unit and we are proposing 204 underground parking places and 296 above ground spaces so we are slightly over the required minimum. We are meeting the required threshold for handicapped spaces.

We met with the Department of Public Works bicycling specialist to confirm the amount and location of both the short and long term parking and are proposing to provide more than the requirement for both. Unfortunately we forgot to show the above grade short term bike racks on the plan but rest assured we will show them once and if we get to the Final plan submission stage. The requirement for long term bike spaces is 1 per 4 units and short term spaces and for short term spaces it is 1 per 10 units.

Inclusionary Zoning

Fifteen percent of the units (37) will meet the Inclusionary Zoning Requirements and we are anticipating that all of these units will be in building B. We are currently in discussions with a local non-profit housing provider whom is interested in taking ownership of this building.

Impact fees, taxes & municipal services:

According to the Cities Impact Fee calculator the following impact fees will be due:
Traffic $46,000, Fire $52,570, Police $10,750, Parks $176,000, Library $109,000 and Schools $227,750 for a total of $622,250. According to the Cities Property Tax Calculator, the total annual property taxes will be approximately $886,462. These impact fees and taxes should certainly alleviate any burden that this project places on any of these services offered by the City.

To recap, we feel that this project is a welcome change to what is on the site today. We feel that the character of the area will improve, the natural environment will be enhanced and both vehicle and pedestrian traffic will be safer. We feel that this will improve the quality of air and water and reduce the amount of current noise pollution associated with the site. The project will enhance the Cities, street, sidewalk, water, sewer and power distribution systems and reduce the amount of soil erosion and untreated storm water entering Centennial Brook and the Winooski River. The project will have on site recreational amenities that include a pool, a game room, community room, a gym, paths and sidewalks to walk or run on as well as large areas of open grassed area play on. Due to the amount of Impact fees, property taxes and jobs created this project will have a positive impact on the Cities municipal services and lastly this project will provide a fair amount of drastically needed quality housing at a low to moderate price.

Respectfully submitted on behalf of the S.D. Ireland Family,

Patrick O'Brien

Scott Gustin

From: Megan Moir
Sent: Tuesday, December 17, 2013 12:11 PM
To: Scott Gustin
Cc: Greg Johnson
Subject: RE: 140 Grove St

Due to the size of the project, they will need State Construction Stormwater and Operational Stormwater Permits.

I do not have a final package for EPSC or PCSW for this project, however I have met with the project representatives and am generally satisfied with the direction they are taking for stormwater management.

- reduction of impervious, including removing all impervious that currently drains to Centennial Brook (a stormwater impaired watershed)
- removal of one of the current entrances to the property which will allow for the removal of culvert on Centennial Brook
- Management of the remaining impervious will be achieved through low impact development techniques (flat grassed infiltration areas and rain gardens) for the smaller storm events with management of larger events within an infiltration basin.

The will need to submit a final package with stormwater narrative, plans and any modeling to demonstrate that they have complied with Chapter 26.

As far as EPSC for a project of this size we will be expecting a fully developed set of EPSC plans in compliance with the Vermont Standards and Specifications for Erosion Prevention and Sediment Control and Chapter 26. In particular, I have asked for EPSC plans to include attention to phasing and for a separate sheet regarding the removal of the existing culvert on Centennial (they will need to show proof of having received approval/review from the Stream Alteration folks at VTDEC – which I believe they have already done). Attention will need to be paid to the phasing of the construction of the infiltration/bioretention areas to avoid clogging from disturbed surfaces. As always, an important BMP will be the regular inspection and sweeping of Grove Street.

For a project of this size, we will require a pre-construction meeting to make sure everyone is on the same page re: the EPSC. There will also need to be a designated On-Site Erosion Control Coordinator.

Scott, let me know if you have any additional questions (and if you have the most recent set of plans for our file so I can make sure that what I have written above is consistent with the plans currently at hand. I am going off of notes from Nov. 6).

Megan Moir, CPESC, CPSWQ
Stormwater Program Manager
C (802) 734.4595
P (802) 540.1748
Email: mmoir@burlingtonvt.gov

From: Scott Gustin
Sent: Tuesday, December 17, 2013 11:50 AM
To: Megan Moir
Cc: Greg Johnson
Subject: 140 Grove St

Megan & Greg,

Do you have any comments relative to stormwater management for the preliminary plat review of SD Ireland's 140 Grove Street project? I'm working on the DRB report now.
Scott

Scott Gustin, AICP, CFM
Senior Planner
Department of Planning & Zoning
149 Church Street
Burlington, VT 05401
Phone: (802) 865-7189
Fax: (802) 865-7195

Scott Gustin

From: Barry Simays
Sent: Friday, December 20, 2013 3:20 PM
To: Scott Gustin
Subject: RE: 140 Grove St

Scott,

In response to your request for additional information or requirements prior to DRB for this project, BFD/FMO adds the following, in addition to original requirements as noted on the TRC comments sheet dated 10/11/2012:

1. All construction (fire protection systems) shall meet the requirements of adopted editions of IBC, NFPA applicable codes, VT Fire and Building Safety Code, and Burlington Code of Ordinances Chapter 13 (at a minimum).

2. All door locks in each individual building shall be keyed to a single master core. Two sets of building master keys plus all required fire alarm system keys shall be provided for building Knox Boxes, where required (BCO 13-60).

3. The Burlington Fire Department has recently developed significant concerns regarding radio signal reliability for our emergency radio communications system in this area of the City based on location and topography. Our office will require that radio testing be conducted in accordance with BCO 13-63 through 13-68. In the event that the results of this testing are not satisfactory, this project will be required to provide improvements to the reliability of our radio system in this area.

4. The re-designed single divided complex access/egress driveway concept is approved by this office. Fire department access roads shall meet the requirements of NFPA 1 (2012).

5. Sprinkler system, fire alarm system, fire pump, standpipe, and master radio call box (MRCB) requirements are as stated in the applicable codes listed above.

6. Common space carbon monoxide detection (fire alarm system devices) shall be required. Devices shall report CO alarm to fire alarm control panels and MRCB's in individual buildings.

If you have any additional questions, please contact this office.

BC Barry Simays, CFI
Fire Marshal
Burlington Fire Department
132 North Avenue
Burlington, VT 05401
(802) 864-5577
(802) 658-7665 (Fax)
bsimays@burlingtonvt.gov

From: Scott Gustin
Sent: Tuesday, November 26, 2013 17:00

To: Norm Baldwin; Jesse Bridges; Barry Simays; cburns@burlingtonelectric.com
Subject: 140 Grove St

All,

FYI, the 140 Grove Street (SD Ireland) redevelopment application for 240+ residential units is now scheduled for the January 7, 2014 Development Review Board meeting. With that in mind, please send me any comments or concerns you have no later than December 20, 2013.

Thank you.

Scott

Scott Gustin, AICP, CFM
Senior Planner
Department of Planning & Zoning
149 Church Street
Burlington, VT 05401
Phone: (802) 865-7189
Fax: (802) 865-7195

City of Burlington
Department of Parks & Recreation
645 Pine Street, Suite B Burlington, Vermont
(802) 864-0123
www.enjoyburlington.com

MEMO

Date: December 20, 2013
To: DRB c/o Scott Gustin
From: Jesse Bridges, Director Parks and Recreation
Re: 140 Grove St.
CC: Patrick O'Brien, Jen Francis, Deryk Roach

Parks and Recreation has met numerous times with the proposers for the 140 Grove St. development. We are supportive of the proposed project and feel that SD Ireland and their partners have been cooperative in the process of developing their plans. We have a few comments that have been expressed to Patrick O'Brien and the group directly that we are confident will be addressed in future plans.

Parking Lot/Crossings

- Parks requests a minimum six foot greenbelt in front of the park parking lot, this area should also be built with at least a 3 foot soil depth for tree planting
- The parking lot should have one entrance for vehicles.
- The back line of the lot should be straightened out.
- The roadway should narrow to allow for the full width greenbelt and traffic calming
- Lighting for the lot should be provided (*Parks will provide SD Ireland with the Parks lighting standard cut sheet)*
- A six foot black chain link fence should be installed along the back of the parking area to prohibit dumping. This will leave the sides for snow storage.
- Signs in the lot would be for park/parking hours (*Parks will provide SD Ireland with specs)*

Park

- The replacement fence should be black metal steel *(Parks will provide SD Ireland with the Parks standard fence spec)*
- Pull the existing sidewalk back from the roadway to create greenbelt and provide for consistent tree language across the front of the park property.
- We are continuing to work with SD Ireland on an ADA path for access into the park, a 2nd crossing to connect the ADA path to the sidewalk and parking lot would be required.
- We are comfortable with the water line through the park; SD has agreed to provide access to waterline for future needs of the Barn facility.

SD Property

- Parks like the use of open play space in the design. This will limit the impact on the open space in Schmanska Park and provide good flexible park type space for the residents.
- We recommend that the open space be connected to the buildings better, used more like a yard. This helps to better manage the space.
- We recommend that the project provide separate dog specific areas as well as signage so the green space is usable for families.

This project will generate significant Parks Impact fees and the Parks Department is committed to utilizing the majority of those funds in the improvement of Schmanska Park given the projects close proximity and expected impact. This could potentially include an expanded and upgraded playground, improved open field space, improved stormwater management techniques, connection points to other neighborhoods and barn renovations.

Scott Gustin

From: Guillermo Gomez
Sent: Monday, December 02, 2013 8:42 AM
To: Scott Gustin
Cc: Norm Baldwin
Subject: Comments: Grove Street Development - Traffic Impact Study

Good Morning Scott:

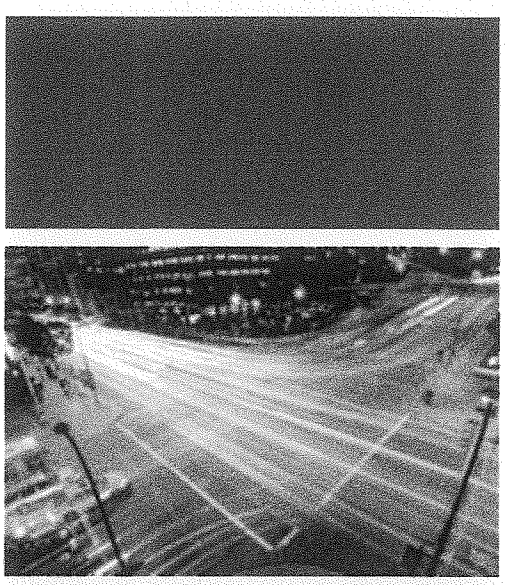
These are the comments/concerns that I have from the Traffic Impact Study and the proposed improvements from the Grove Street Development at the SD Ireland Site.
I sent these to Patrick O'Brien at the end of the week before Thanksgiving, so I don't know if they will have incorporated anything related to these comments to their plans/report for the next time you meet.
Please let me know if you have any questions.

- I noticed that the site layout has changed from what was originally proposed, consolidating all traffic access will be through a single driveway. The development needs to be mindful of pedestrians walking along Grove Street. There needs to be a discussion about the geometry of the driveway (minimize lane widths, need for turning pockets and proposed dimensions (widths and lengths) for all of these). Given the considerable width and the volume of vehicles entering and exiting the driveway, you should consider providing a pedestrian refuge (an island, separator or something equivalent).
- The study should examine transportation options for school children living in the development. I encourage you to have a conversation with CCTA to evaluate the possibility of extending bus service to the development. It is my understanding that there is no CCTA service planned at the moment for this area. If this is the case for now, please include an analysis of possible pedestrian routes for students to the nearest bus stop. Also you should include proposed improvements along these routes (the proposed sidewalks partially address this) and make sure the bus stops have the appropriate amenities to accommodate the future demand.
- If students are likely to use the sidewalk on the east side of Grove Street and then use the crosswalk past the Schmanska Park parking area, consider making the crossing safer. One option could be using a Rectangular Rapid Flashing Beacon, like the one installed in front of Edmunds School. Consider realigning this crosswalk at STA 19+00 to cross Grove Street at a 90 degree angle. You will need to include painted crosswalks across the entrance and exit of the Schmanska Park parking area and built a receiving pedestrian ramp just north of the exit of the parking area.
- You should also include a discussion about transportation options for senior citizens. Will there be a centralized location for SSTA to pick-up people within the development?
- One of the mitigation measures proposed by the traffic study is providing a contribution of $6,000 to the realignment of the Colchester Avenue/Riverside/Barrett Street intersection. There are a number of reasons why this realignment is not likely to happen in the near future and in the meantime, we need to accommodate safely the increased demand on this intersection. The traffic engineer should provide recommendations of improvements based on the existing geometry and conditions of the intersection (these improvements could be signalization upgrades, pedestrian countdown signals, or anything else that the traffic engineer concludes that could contribute to the operation of the intersection).
- The Turn Lane Warrant Assessment conducted for the study suggests that no left turn is warranted for access to the development. Could you provide a more thorough description of the methodology? Given the size of the development, the traffic volumes and the fact that there is only one driveway into the development, I was expecting a left turn lane into the development to be part of the design.
- The queuing results summarized in Figure 17 show queues that seem too low for the traffic volumes in the area.(A queue of 2 vehicles in the AM Peak Hour for 100 exiting vehicles sounds too low). Please make sure these are accurate.

Thanks

Guillermo Gomez
Public Works Engineer
City of Burlington
645 Pine St
Burlington, VT 05401
Phone: (802)-540-0557
E-mail: ggomez@burlingtonvt.gov

RSG INC.
TRANSPORTATION



Traffic Impact Study

Grove Street Development

Burlington, VT

October 2013

PLANNING ■ ENGINEERING ■ DESIGN

Report Prepared by:

55 Railroad Row, White River Junction, Vermont 05001
TEL 802.295.4999 • FAX 802.295.1006 • www.rsginc.com

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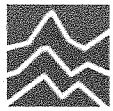


1.0 EXECUTIVE SUMMARY

This study evaluates the traffic impacts associated with the proposed redevelopment of the SD Ireland concrete batch plant on Grove Street in Burlington, Vermont into a residential use. The proposed project includes 247 apartment units.

1.1 Key Findings

Key findings, presented in greater detail below, include:

1. The proposed Grove Street housing project would replace the existing SD Ireland concrete batch plant on Grove Street in Burlington, Vermont with a 247 unit apartment development.
2. Using trip generation rates presented by the Institute of Transportation Engineers (ITE) for this land use, we calculate this project would generate approximately 125 new vehicle trips during the AM peak hour (25 entering and 100 exiting) and 154 vehicle trips during the PM peak hour (100 entering and 54 exiting).
3. Removal of the existing SD Ireland concrete plant will result in a reduction of existing concrete plant traffic, including heavy vehicle and passenger car traffic, in this area. Based on average production levels and existing administrative operations at the plant, we expect this project to eliminate approximately 61 existing AM peak hour trips (41 entering and 20 exiting) and approximately 61 existing PM peak hour trips (22 entering and 39 existing) from the local roadways.
4. Long delays and Level of Service F conditions exist at the Riverside Avenue/Barrett Street and Colchester Avenue/Barrett Street intersections and at the US 2/White Street intersection, with or without the addition of site-generated traffic. Delays at all other study area intersections are projected to remain at acceptable levels and increase by fewer than 5 seconds per vehicle with the addition of project generated traffic.
5. A review of historic VTrans crash data identified three High Crash Locations within the study area at the Colchester Avenue/Barrett Street intersection, at the Patchen Road/White Street intersection, and at the US 2/White Street intersection.
6. RSG recently conducted the Colchester Avenue Corridor study as a planning document for the Chittenden County Regional Planning Commission and identified a preferred alternative for reconstructing the Colchester Avenue/Riverside Avenue intersection triangle and we recommend this improvement be pursued to improve both operations and safety in this area, with or without the proposed project.
7. At the US 2/White Street intersection, major improvements are currently planned as part of the City Center initiative and Market Street improvements project. Improvements on Market Street are currently slated for fiscal year 2016 in the 2013-2016 CCRPC Transportation Improvement Program (TIP). Full improvements at the US 2/White Street intersection, are currently planned but are not yet included in the near term Transportation Improvement Program.
8. At the Patchen Road/White Street intersection overall LOS B and LOS C conditions are maintained during the weekday AM and PM peak hours, respectively, with the addition of project generated traffic.
9. Using the City of Burlington's impact fee calculator, we calculate approximately $53,600 in traffic impact fees to be associated with the proposed project.
10. We have also examined the proposed site access on Grove Street and have found that stopping and corner sight distances exceed design standards in both directions.

11. We conducted a turn-lane warrant assessment and found that a dedicated left-turn lane is not warranted on Grove Street at the site access.
12. We project average vehicle delays of less than 20 seconds per vehicle for traffic exiting the site driveway and expect the access to operate safely and effectively.
13. We have examined plans for proposed off-site traffic calming and pedestrian accommodation improvements prepared by O'Leary Burke Civil Associates including new sidewalks, crosswalks, new curbing, new lighting, and a proposed solar powered speed feedback display.
14. We believe the proposed pedestrian improvements greatly enhance the existing infrastructure. The proposed sidewalk section south of the project site provides a critical pedestrian link between South Burlington and Burlington and Winooski, creating a continuous pedestrian route between these areas. Additionally, improved curbing signage and striping at crossings north of the project site will help improve pedestrian safety for all pedestrians in the area.

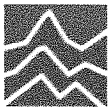
1.2 Recommendations

Recommendations arising from the analysis presented below include:

1. We recommend a cost sharing allocation be paid by the developer to the City of Burlington towards eventual improvements at the Colchester Avenue/Riverside Avenue/Barrett Street intersection triangle. This area currently experiences long delays and has been identified for future improvements by the Chittenden County Regional Planning Commission c. While the proposed project does not cause this issue, we suggest the developer make a fair share contribution towards the ultimate intersection improvements based on the percent increase in peak hour traffic from the proposed project and the estimated cost of the overall improvement. Based on the larger peak hour percent increase in traffic (0.43% during the PM peak) and the estimated project cost ($1.4 million)[1], we calculate a fair share contribution of approximately $6,000.
2. We recommend a cost sharing allocation be paid by the developer to the City of South Burlington towards eventual improvements at the US 2/White Street intersection. This area currently experiences long delays and has been identified for future improvements by the Chittenden County Regional Planning Commission based on heavy use by existing traffic. While the proposed project does not cause this issue, we suggest the developer make a fair share contribution towards the ultimate intersection improvements based on the percent increase in peak hour traffic from the proposed project and the estimated cost of the overall improvement. Based on the larger peak hour percent increase in traffic (0.41% during the AM peak) and the estimated project cost ($3.94 million) [2], we calculate a fair share contribution of approximately $16,000.
3. Due to the high prevalence of rear-end collisions at the Patchen Road/White Street intersection we recommend advance intersection warning signs (MUTCD W3-3) be installed on both the eastbound and westbound, White Street, approaches to this intersection. Similar signs already exist on the northbound and southbound, Patchen Road approaches (Figure 36).
4. To enhance pedestrian connectivity and to improve pedestrian accommodations proximate to the project site, we recommend all off-site traffic calming and pedestrian enhancements identified by O'Leary Burke Civil Associates be installed prior to the first certificate of occupancy for the project.

[1] The December 2011 Colchester Avenue Corridor Plan, conducted by Resource Systems Group indicated an approximate project cost of $1.4 million to reconstruct the Colchester Avenue/Riverside Avenue/Barrett Street intersection triangle.

[2] The August 2007 US 2 Corridor Study, conducted by Resource Systems Group indicated an approximate project cost of $3.94 million to reconstruct the US 2/White Street and US 2/Patchen Road intersections.



5. In addition to the pedestrian enhancements proposed by O'Leary Burke Civil Associates we recommend the existing pedestrian warning signs at the crosswalk on Grove Street north of the paved public parking area (north of the project access) be upgraded to new fluorescent yellow warning signs (W11-2) and be accompanied by diagonal arrows indicating the crossing location (W16-7P) and that these signs be gate-posted for both northbound and southbound traffic prior to the first certificate of occupancy for the project. We recommend similar signage be installed at the second pedestrian crossing approximately 300 feet north of this parking area at the north end of the park.

6. Due to the tight turning radius for the southbound right-turn from Barrett Street onto Grove Street, we recommend the "No Parking Here To Corner" sign be relocated as indicated by O'Leary Burke Civil Associates, assuming Burlington Public Works is willing to accept the associated reduction in on-street parking.

We believe that if the above recommendations are followed, traffic associated with construction of the proposed Grove Street housing project will not cause unreasonable congestion or unsafe conditions on the surrounding road network.

2.0 INTRODUCTION

This study evaluates the traffic impacts associated with the proposed redevelopment of the SD Ireland concrete batch plant on Grove Street in Burlington, Vermont into a residential use. The proposed project includes 247 apartment units. This Traffic Impact Study includes the following items:

- The project description and study scope
- Traffic volumes with and without the project
- Estimated congestion with and without the project
- Estimated queue lengths with and without the project
- A safety analysis
- Recommendations

This study relies upon design standards and analysis procedures documented in the 2000 *Highway Capacity Manual*,[1] Trip Generation,[2] *A Policy on Geometric Design of Highways and Streets*,[3] *Manual on Uniform Traffic Control Devices* (MUTCD),[4] *Traffic Impact Evaluation: Study and Review Guide*,[5] and the Vermont State Design Standards.[6]

3.0 PROJECT DESCRIPTION

The proposed project would replace the existing SD Ireland concrete batch plant on Grove Street in Burlington, Vermont with 247 units of apartment housing. The proposed project site plan is shown below in Figure 1. All development traffic would access the surrounding road network via a single driveway onto Grove Street.

[1] Transportation Research Board, *Highway Capacity Manual* (Washington, DC: National Academy of Sciences, 2000).

[2] Institute of Transportation Engineers, *Trip Generation* 9th Edition (Washington, D.C.: Institute of Transportation Engineers, 2012).

[3] American Association of State Highway and Transportation Officials (AASHTO), *A Policy on Geometric Design of Highways and Streets*, 6th Edition (Washington DC: AASHTO, 2011).

[4] American Traffic Safety Services Association (ATSSA), ITE, and AASHTO, *Manual on Uniform Traffic Control Devices*, 2009 Edition (Washington DC: FHWA, 2009).

[5] Vermont Agency of Transportation, Development Review Section, *Traffic Impact Evaluation Study and Review Guide* (October 2008).

[6] State of Vermont Agency of Transportation, *Vermont State Standards* (Montpelier: VTrans, 1 July 1997).

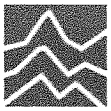
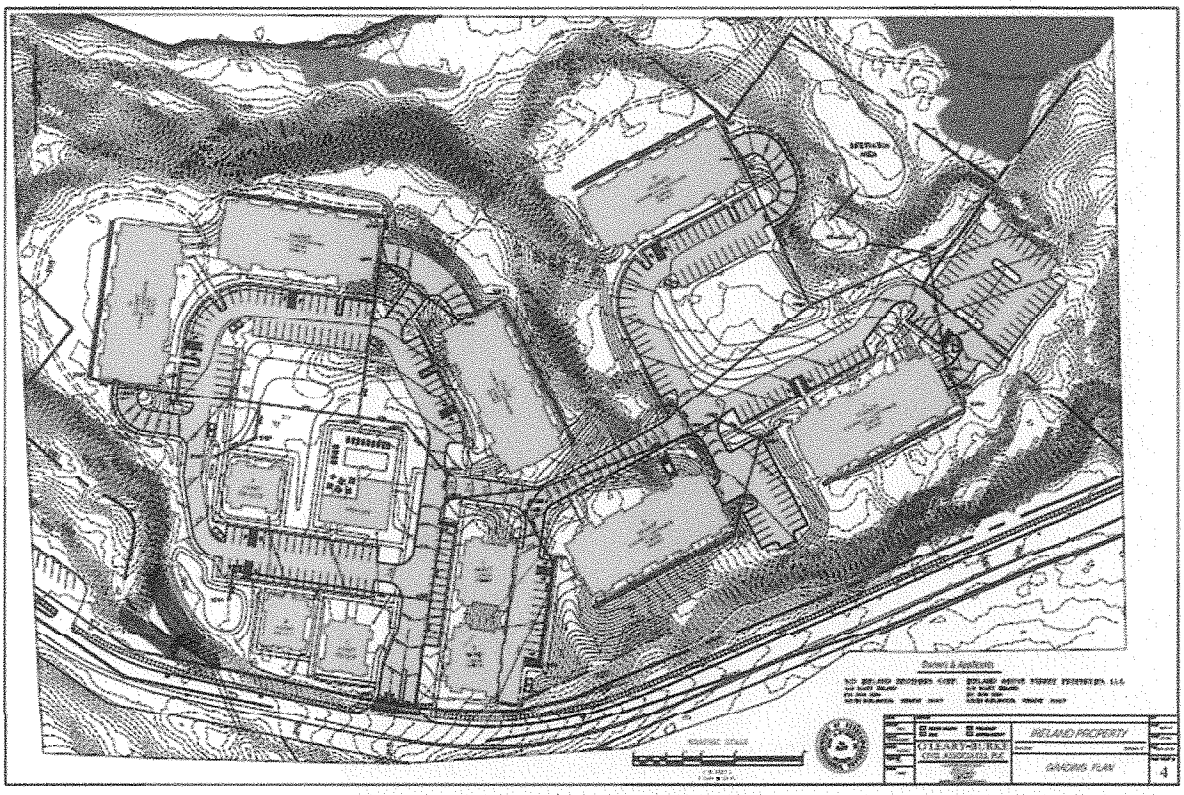


Figure 1: Site Plan



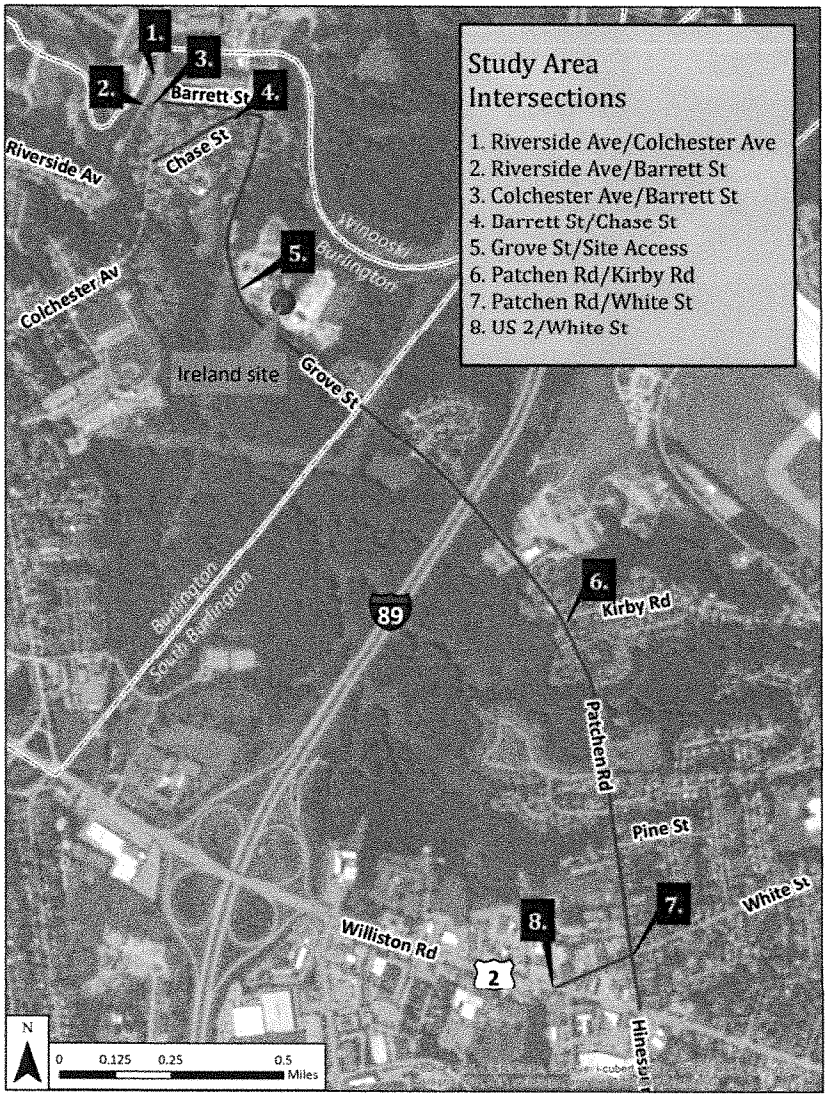
4.0 GEOGRAPHIC SCOPE OF STUDY

VTrans guidelines specify that a traffic study should be considered if the proposed development will generate 75 or more peak hour trips. The geographic scope of the study should also include the immediate access points and those intersections or highway segments receiving 75 or more project-generated peak hour trips.[1]

As presented in greater detail in Section 4.4, the Grove Street/Site Access intersection is projected to experience 75 or more peak hour trips as a result of the proposed project. Although no other intersections are projected to meet the 75 vehicle trip per hour VTrans threshold, additional analysis intersections are included based on conversations with Planning and Public Works Department staff in Burlington and South Burlington. Figure 2 presents the names and locations of the nine total study intersections.

[1] Vermont Agency of Transportation, Traffic Research Unit, *Traffic Impact Study Guidelines* (October 2008).

Figure 2: Study Area Intersections

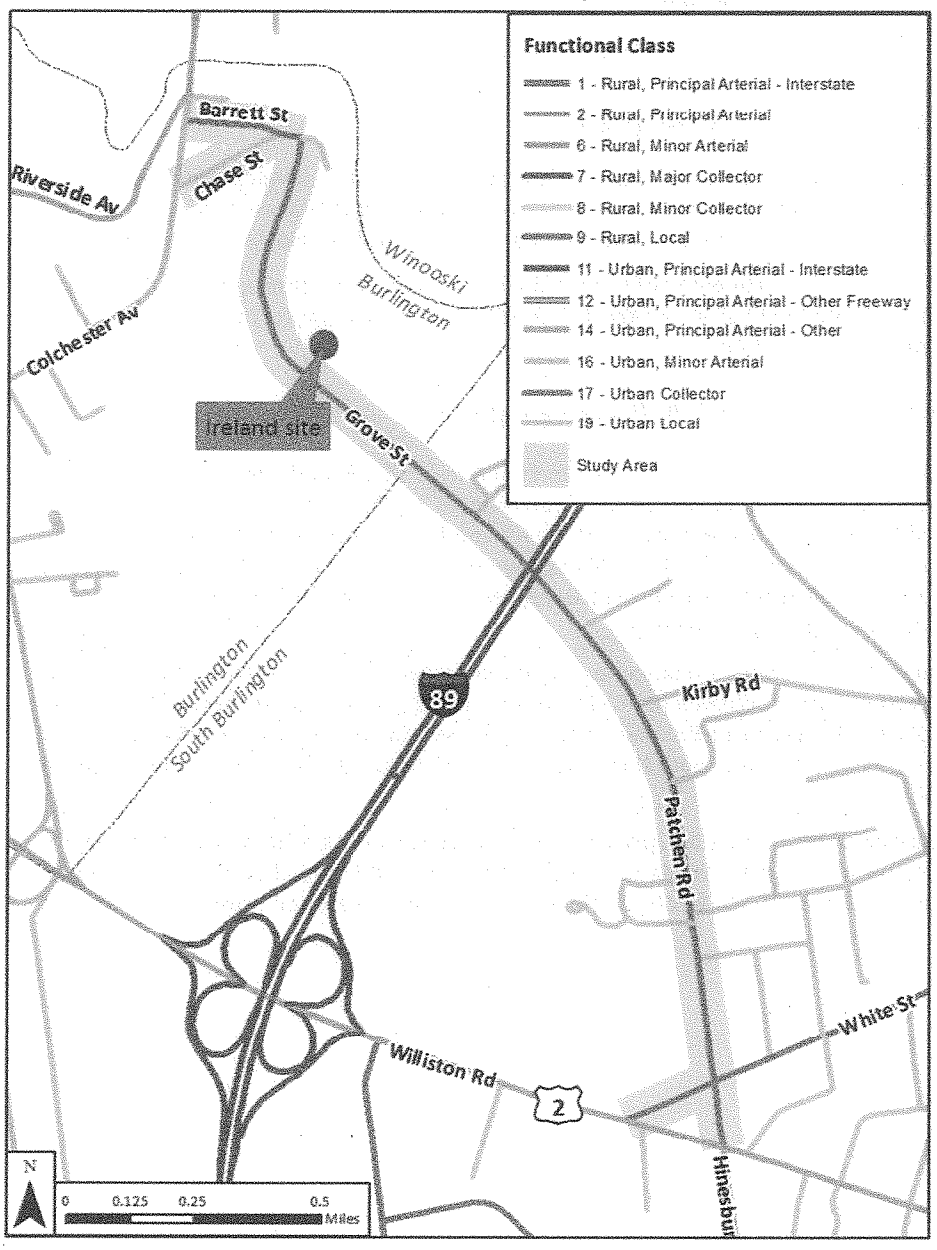


4.1 Local Traffic

In Burlington, Grove Street begins at Barrett Street and ends at the South Burlington town line. From there, Grove Street becomes Patchen Road and continues in South Burlington south to US 2. Grove Street and Patchen Road are both classified as Urban Collectors (Figure 3). In 2009 VTrans recorded an Annual Average Daily Traffic (AADT) volume of 6,000 vehicles per day on Patchen Road.[1] The speed limit on Patchen Road and Grove Street is posted at 25 mph.

[1] The AADT was measured at VTrans count station S6D332 just north of Pine Street in South Burlington.

Figure 3. Functional Classification of Study Area Roads and Adjacent Area



This analysis examines conditions during the weekday AM and PM peak design hours. Vermont traffic conventions typically call for analyzing traffic conditions in the base year (the year construction is estimated to be complete) and five years in the future. However, statewide VTrans continuous traffic count (CTC) data on all Urban roads as well as Burlington specific CTC data from count station P6D001 on VT 127 indicate no background traffic growth over the next 20 years[1]. Because no background traffic growth is projected in the study area, a separate future year analysis is not included. Therefore, the following scenarios are evaluated in this study:

[1] *Continuous Traffic Counter Grouping Study and Regression Analysis*, VTrans Traffic Research Unit, 2012

- 2016 No Build (AM and PM peak hours)
- 2016 Build, including traffic from the proposal (AM & PM peak hours)

4.2 Other Development Volumes

Other development volumes (ODVs) represent trips generated by anticipated developments in the study area that have been permitted but not yet constructed. Trips generated by ODVs are included in every scenario because we assume they are already present on the road network in the No Build scenario.

We have spoken with Planning Department staff in both Burlington and South Burlington and identified the City Center[1] project in South Burlington and the 110 Riverside Avenue[2] project in Burlington to be included in the background traffic volumes.

4.3 Scenario Volumes and Adjustments

RSG conducted weekday turning movement counts from 7:00 AM – 9:00 AM and from 4:00 PM – 6:00 PM at five of the study intersections on December 18, 2012. Additional 2009 turning movement count data from VTrans were used for the US 2/White Street and the Riverside Avenue/Colchester Avenue intersections. Weekday AM peak hour (7:30-8:30 AM) and weekday PM peak hour (4:30-5:30 PM) traffic count volumes from these counts were then adjusted to represent the design hour volume (DHV)[3] in 2016 using the following two adjustment factors:

7. Design hour adjustment factors are based on VTrans short term counter S6D213, located on White Street west of Patchen Road and CCRPC counter D022, located on Colchester Avenue just south of Mill Street.[4] Design Hour Volume (DHV) adjustment factors increase Burlington intersection counts by 17% and South Burlington intersection counts by 22% to achieve design hour conditions.
8. An annual adjustment factor, which represents general background traffic growth, is based on average growth trends for urban roads in Vermont, as presented in the 2012 VTrans Redbook.[5] As noted above, the 2012 VTrans Redbook projects no future background growth on urban roads.

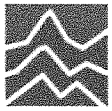
[1] The City Center project is a major initiative in South Burlington that includes new streets and encourages mixed use-development. Traffic volumes for this ODV were obtained from the Market Street improvements Traffic Study conducted by Vanasse Hangen Brustlin, Inc.

[2] This project consists of a 57 unit apartment building located at 110 Riverside Avenue in Burlington, VT.

[3] The DHV is the 30th highest hour of traffic for the year and is used as the design standard in Vermont.

[4] VTrans count station S6D213 had an AADT of 6,700 in 2009 and CCRPC counter D022 had an AADT of 14,800 in 2009, which was the most recent year of available data at both counters.

[5] As presented in the 2012 VTrans Redbook, historic traffic trends in Vermont indicate no background growth for Urban roadways or at Burlington specific CTC station P6D001.



4.4 Trip Generation

Trip generation refers to the number of new vehicle trips originating at or destined for a particular development. For this analysis we used trip generation rates from the Institute of Transportation Engineer's *Trip Generation*[1] to estimate peak hour site-generated traffic. Considering the 247 proposed units of apartment housing, we have estimated new project trip generation at the site using ITE Land Use Code 220 (Apartment). During the weekday AM peak hour we project the site will generate 125 vehicle trips (25 entering and 100 exiting). During the weekday PM peak hour we project the site will generate 154 vehicle trips (100 entering and 54 exiting).

Figure 4: Trip Generation Summary

AM Peak Hour: 125 trips (25 enter, 100 exit)
PM Peak Hour: 154 trips (100 enter, 54 exit)

New vehicle trips were distributed onto the surrounding road network following background residential traffic patterns obtained from traffic counts conducted by RSG at the Patchen Road/Valley Ridge Road intersection, approximately 0.4 miles to the south.[2] Beyond the initial distribution at the site driveway, site traffic was distributed based on background traffic patterns.

While the proposed residential use will add traffic to the study area road network, the removal of the existing SD Ireland concrete batch plant will remove existing concrete-related traffic from the study area road network. To account for existing concrete plant related traffic, we have discussed current operation levels with plant management. From this discussion, we understand the plant produces on average approximately 600 yards of material per day with approximately 6.5 yards per delivery vehicle. Additionally, the site requires approximately 50 yards of aggregate per day, 8 loads of cement per day, and also dispatches approximately 35 pump loads per day and 20 block, boom, and form trucks per day. Summing up all truck activity results in approximately 205 truckloads per day generated from this site. We understand the plant typically operates from 6:00 AM to 6:00 PM and that plant operations are reasonably consistent over the course of the 12 hour day. The plant employs approximately 100 people, including administrative staff who occupy approximately 17,500 square feet of office space on-site. Based on plant production and truck information, along with ITE trip generation rates for general office use (ITE Land Use 710), we assume the plant currently generates approximately 61 one-way trips during the weekday AM peak hour (41 entering and 20 exiting) and approximately 61 one-way trips during the weekday PM peak hour (22 entering and 39 exiting) on an average day.

Figure 5 presents a summary of assumptions and estimates for the existing traffic generated by the SD Ireland concrete batch plant.

[1] Institute of Transportation Engineers, *Trip Generation* 9th Edition (Washington, D.C.: Institute of Transportation Engineers, 2012).

[2] The weekday AM peak hour count was conducted on 25 January 2013 and the weekday PM peak hour count was conducted on 18 December 2012.

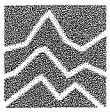


Figure 5: Existing Concrete Plant Traffic Summary

Technical Operations

Concrete Production	
600	yards of concrete per average day
6.5	yards of concrete per truck load
92	loads of concrete per day

Raw Materials and Support Trucks	
50	loads of aggregate per day
35	pump loads per day
20	block boom and form loads per day
8	loads of cement per day
113	raw material and support loads per day

Hourly Trip Summary	
205	truck loads per day
12	hours per day of operation
17	truck loads per hour
34	truck trips per hour

Administrative Support

ITE Land Use 710 (General Office)	
17,500	square feet of administrative space
1.56	AM peak hour trips/1,000 sq. ft.
1.49	PM peak hour trips/1,000 sq. ft.

Administrative Peak Hour Distribution	
88%	enter during AM peak hour
12%	exit during AM peak hour
17%	enter during PM peak hour
83%	exit during PM peak hour

Hourly Trip Summary	
24	enter during AM peak hour
3	exit during AM peak hour
4	enter during AM peak hour
22	exit during AM peak hour

Existing Operations Trip Generation Summary

41 enter during AM peak hour
20 exit during AM Peak hour
22 enter during PM peak hour
39 exit during PM Peak hour

Figure 6 through Figure 9 present the distribution of new housing development traffic and the reduction of concrete plant generated traffic.

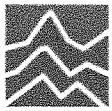


Figure 6: AM Peak Hour Grove Street Housing Trip Generation

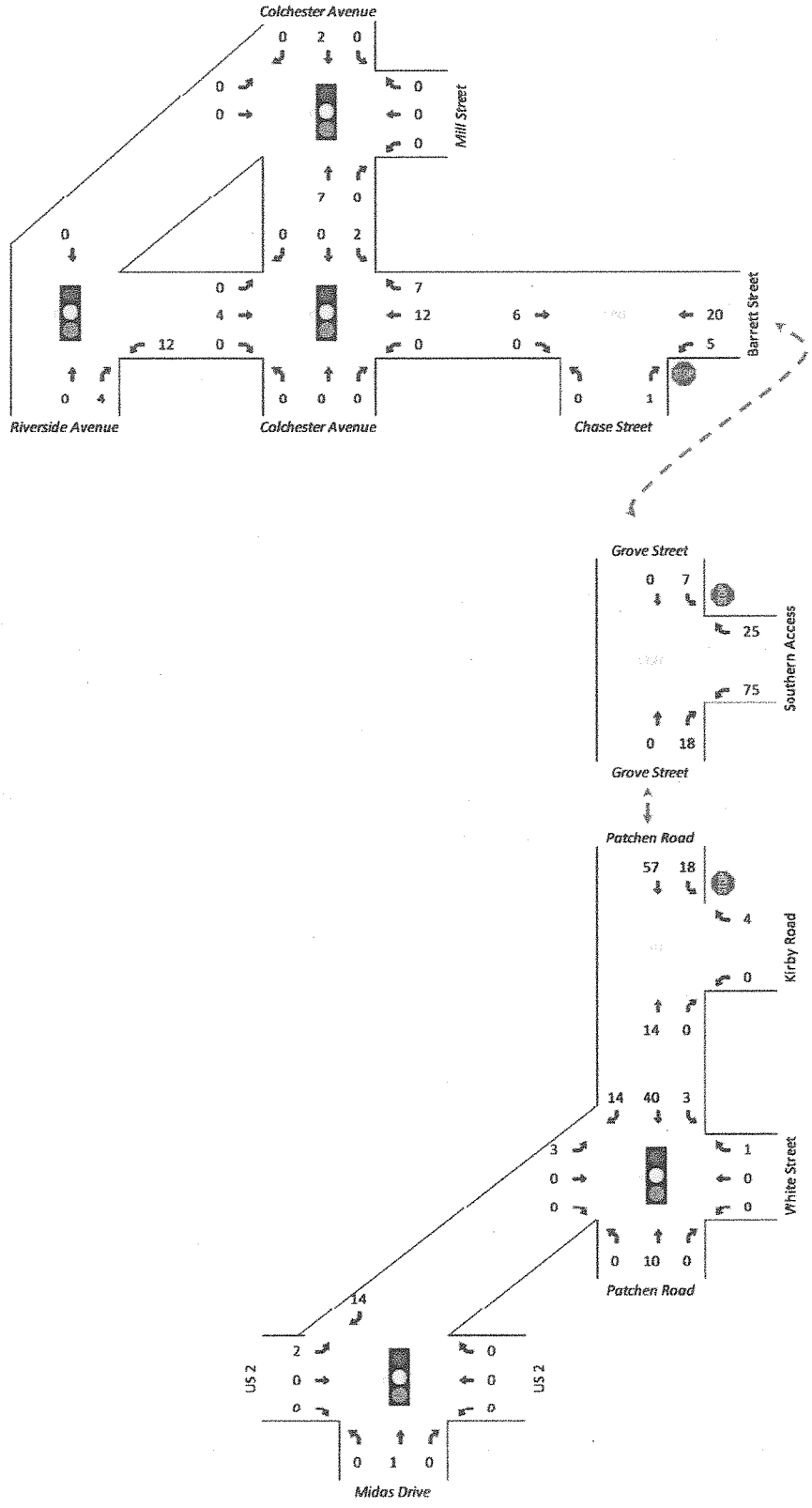


Figure 7: PM Peak Hour Grove Street Housing Trip Generation

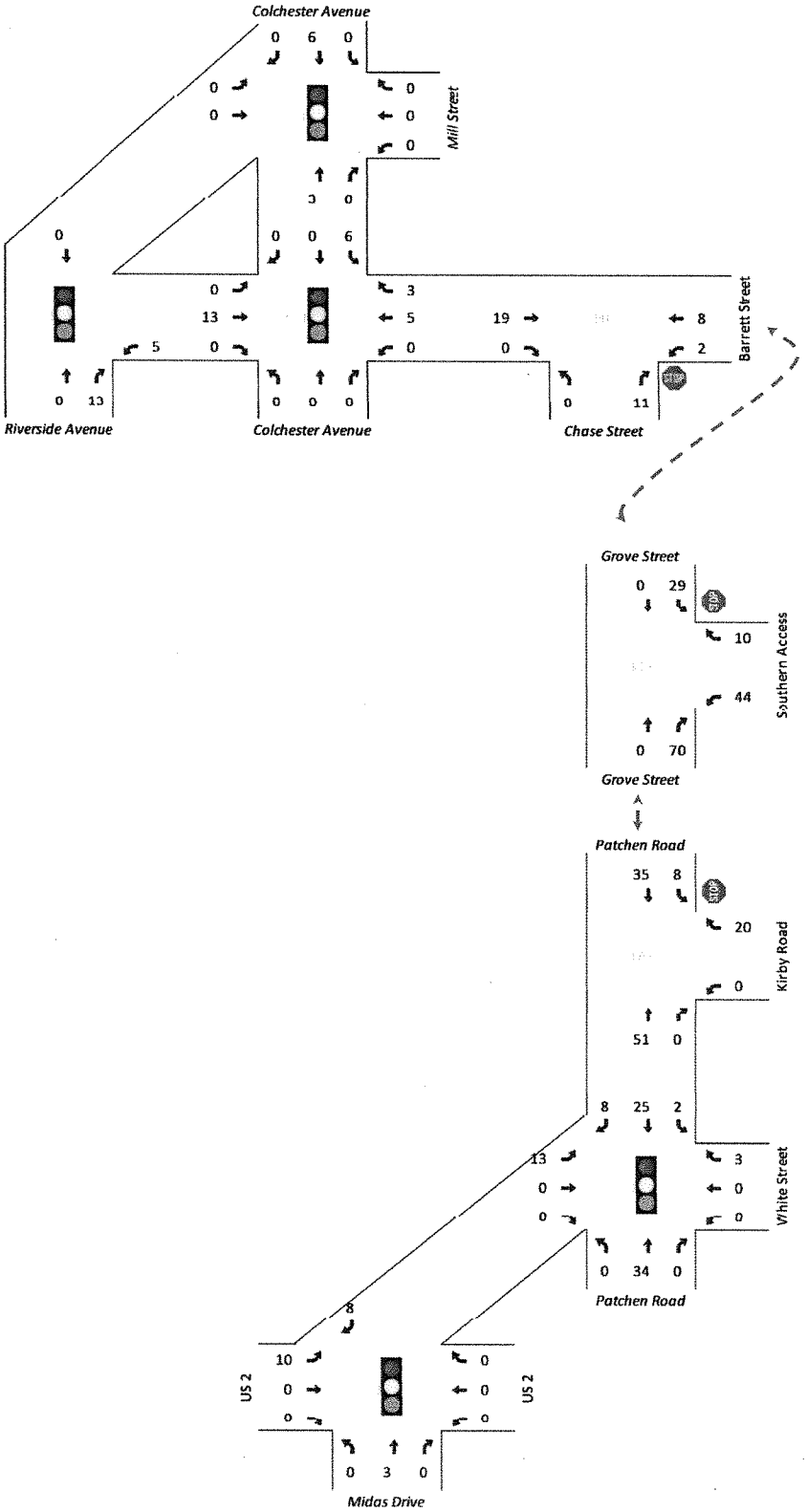


Figure 8: AM Peak Hour SD Ireland Concrete Trip Reduction

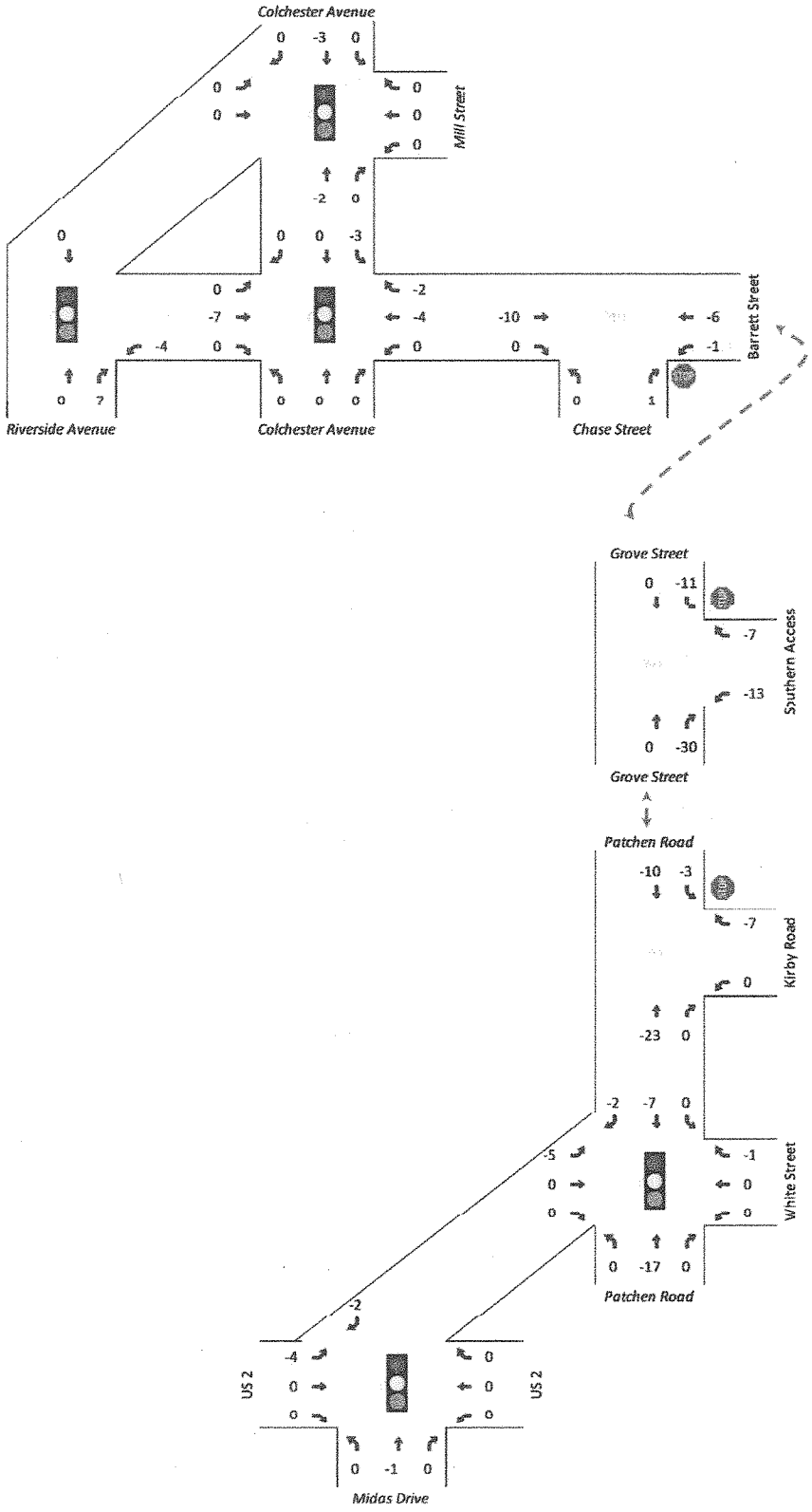
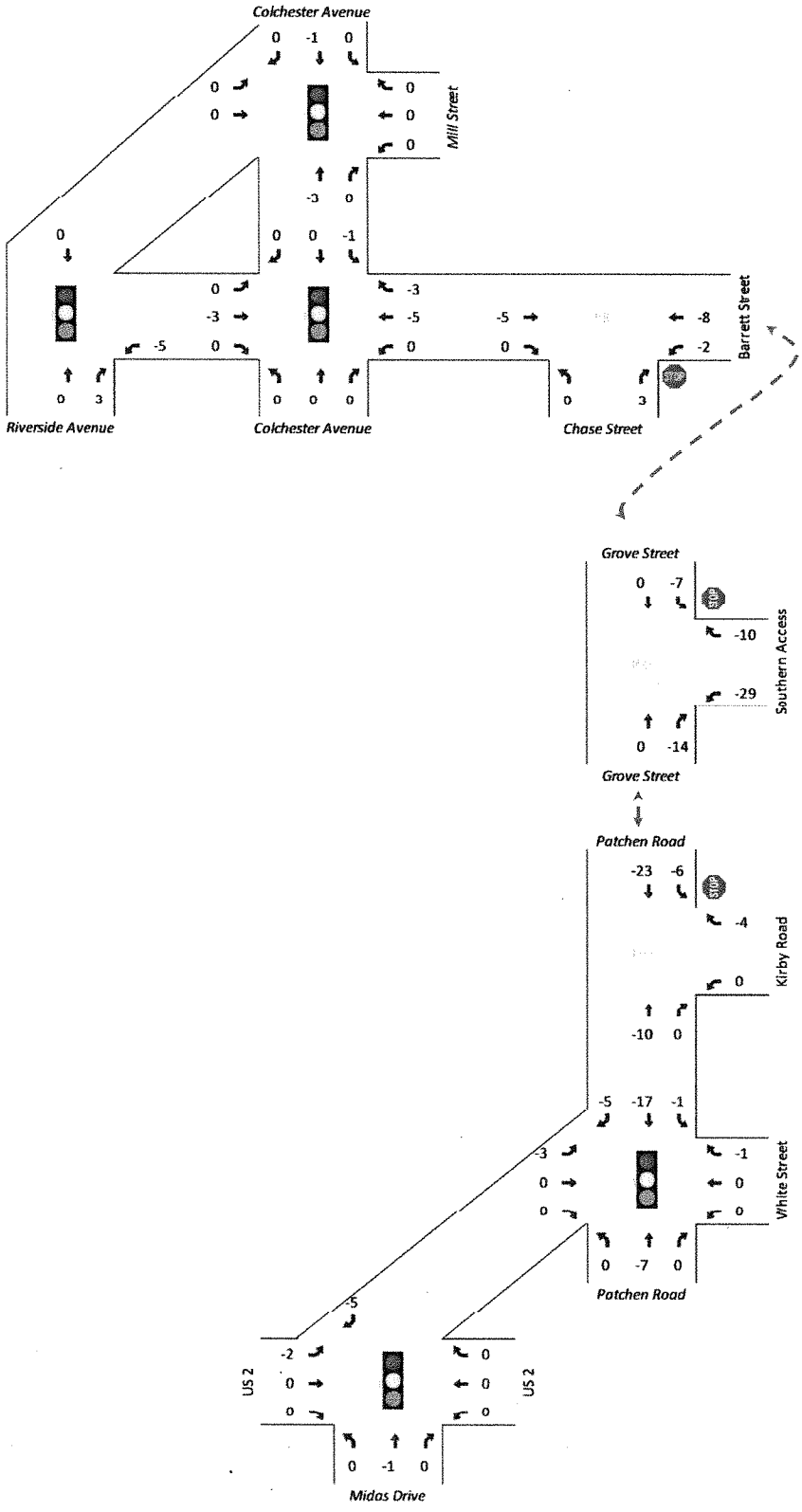


Figure 9: PM Peak Hour SD Ireland Concrete Trip Reduction



4.5 Scenario Volume Graphics

Weekday AM and PM peak hour volumes for the 2016 No Build and Build scenarios are presented in Figure 10 through Figure 13. No Build volumes represent the design hour adjusted count volumes plus the addition of other development traffic (ODVs) as noted above. Build scenario volumes add project generated traffic and remove existing Ireland concrete traffic from the No Build volumes.

Figure 10: 2016 AM Peak Hour No Build Scenario Volumes

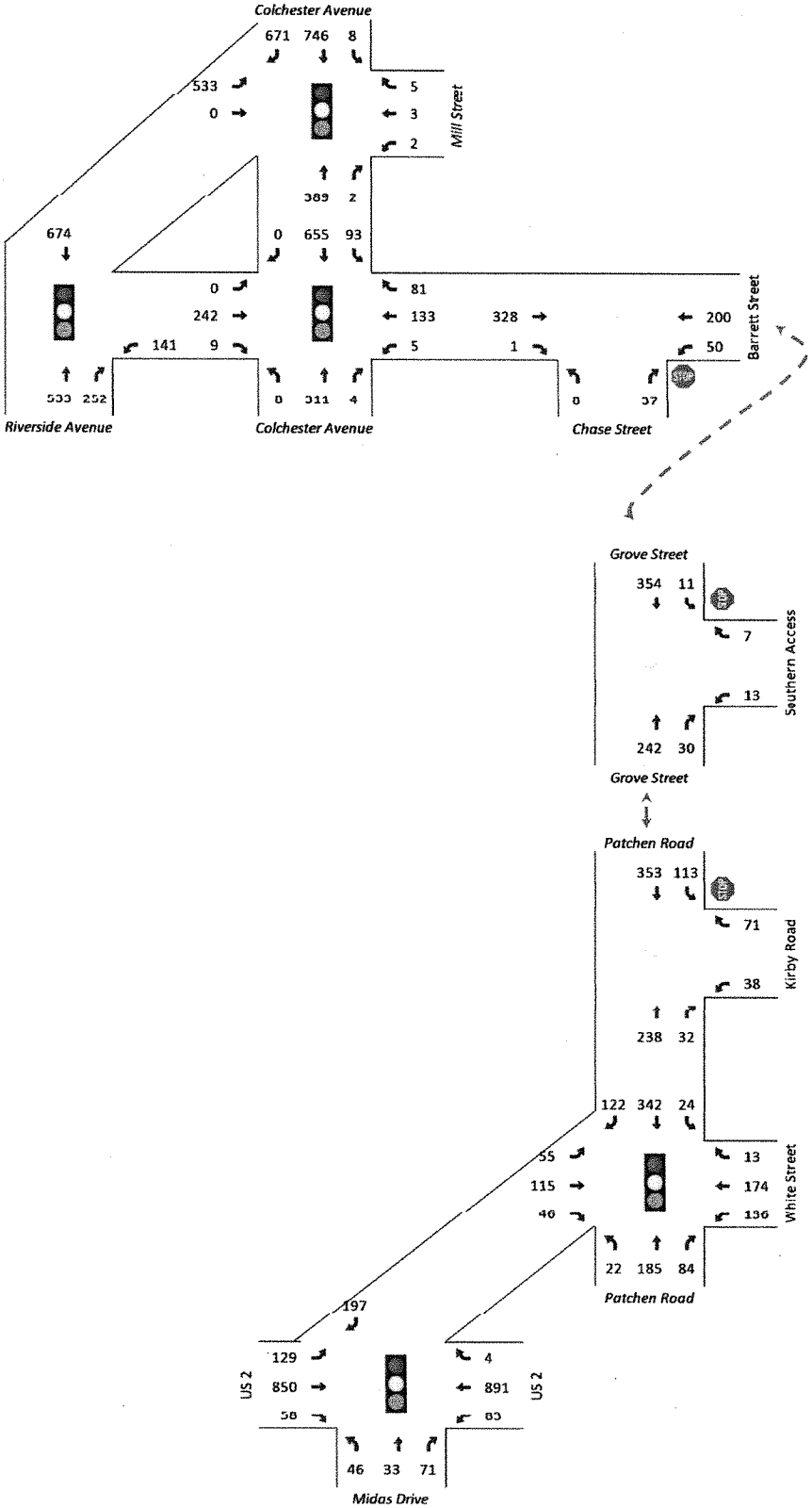


Figure 11: 2016 PM Peak Hour No Build Scenario Volumes

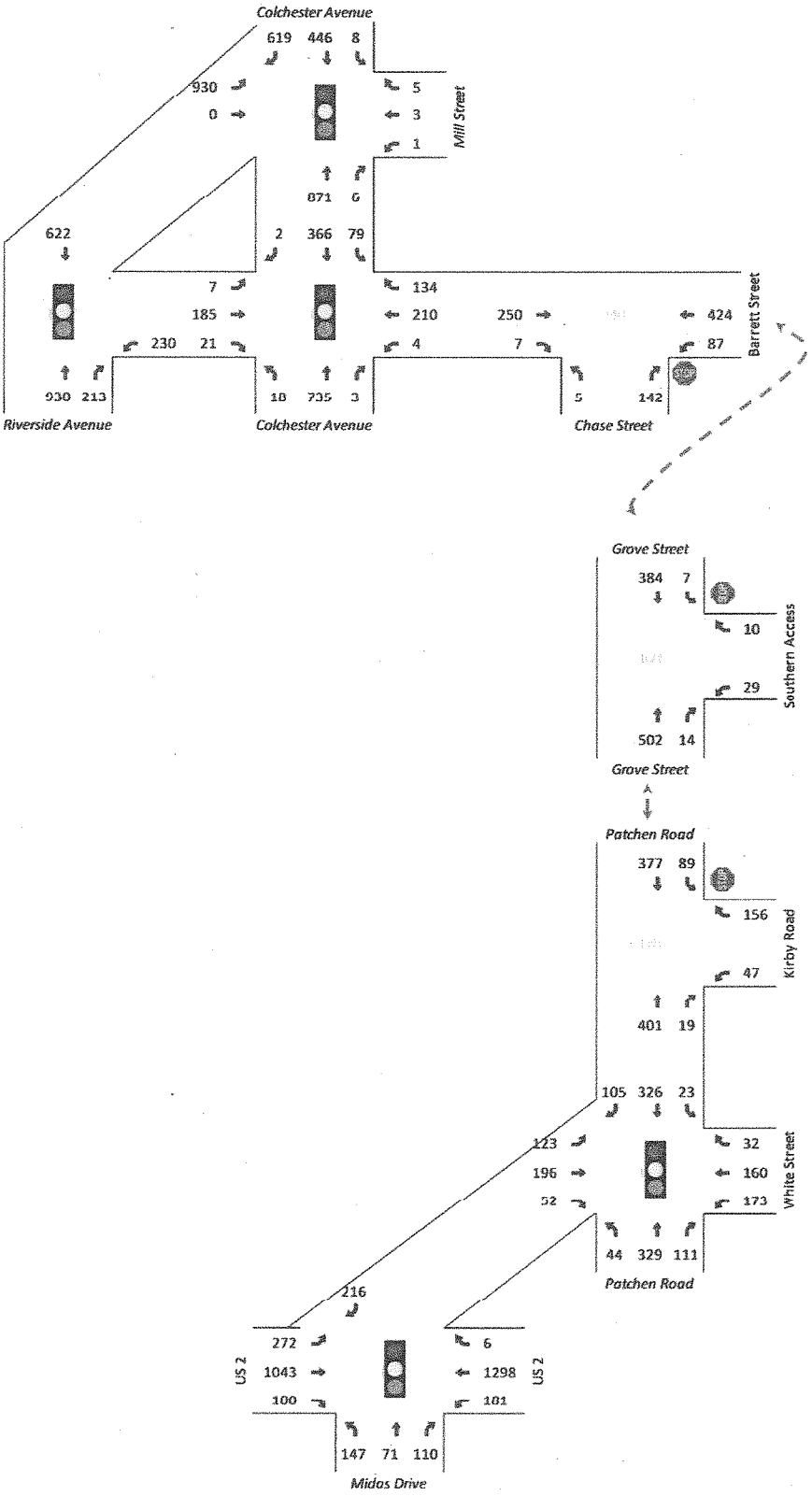


Figure 12: 2016 AM Peak Hour Build Scenario Volumes

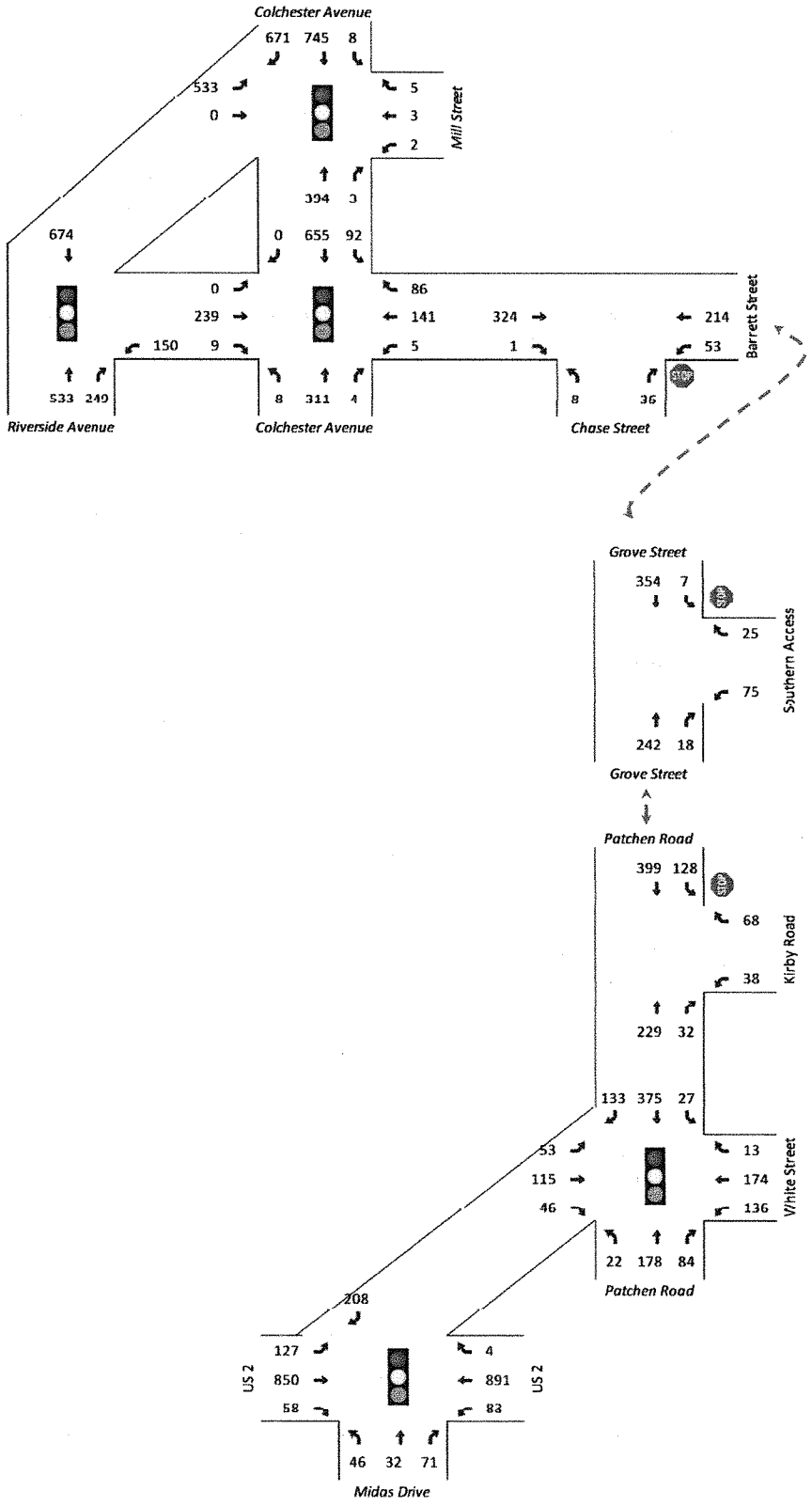
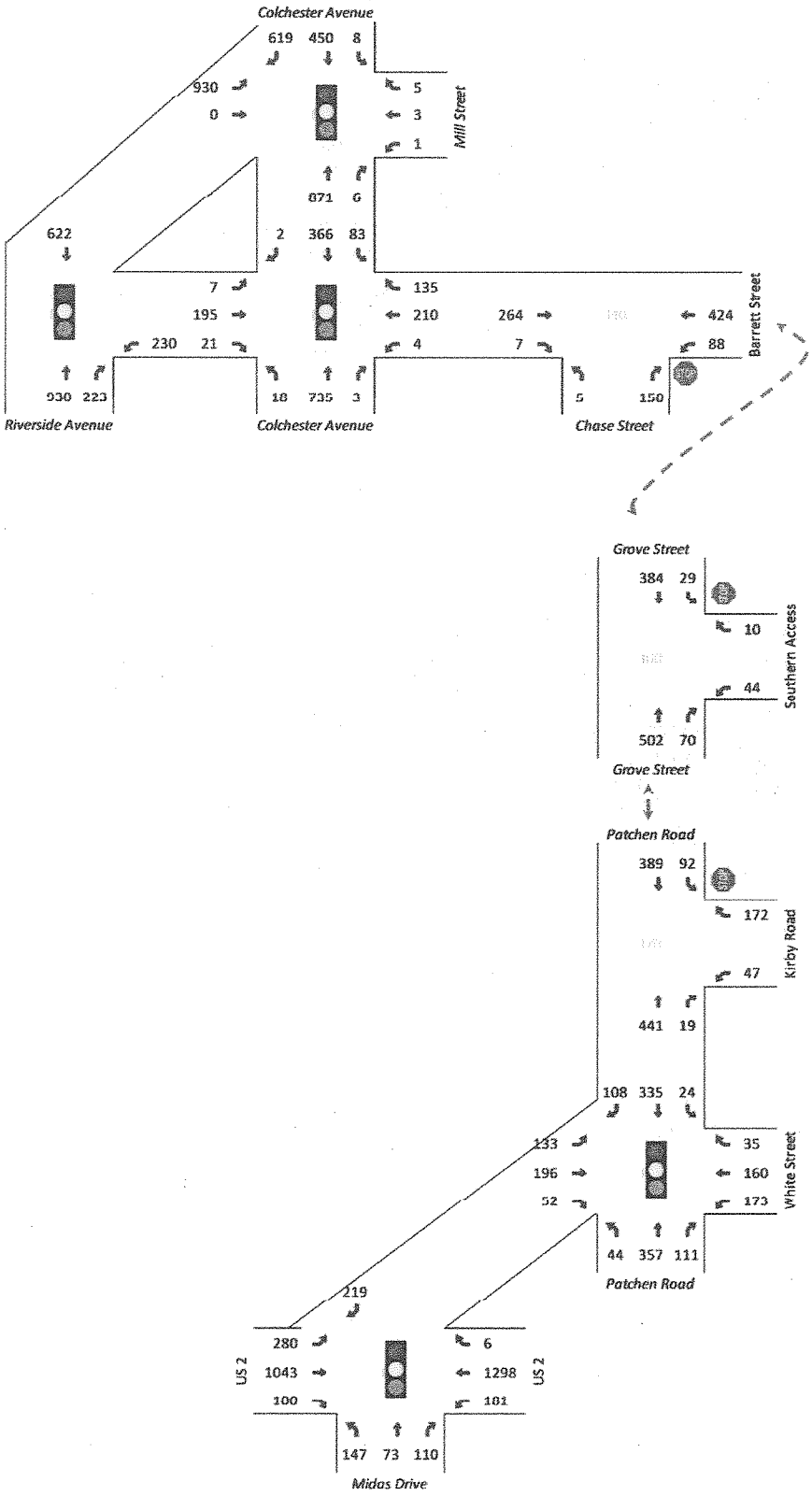


Figure 13: 2016 PM Peak Hour Build Scenario Volumes



5.0 CONGESTION ANALYSIS

5.1 Level-of-Service Definition

Level-of-service (LOS) is a qualitative measure describing the operating conditions as perceived by motorists driving in a traffic stream. LOS is estimated using the procedures outlined in the 2000 Highway Capacity Manual. In addition to traffic volumes, key inputs include the number of lanes at each intersection and the traffic signal timing plans. The LOS results are based on the existing lane configurations and control types (signalized or unsignalized) at each study intersection.

The 2000 Highway Capacity Manual defines six qualitative grades to describe the level of service at an intersection. Level-of-Service is based on the average control delay per vehicle. Figure 14 shows the various LOS grades and descriptions for signalized and unsignalized intersections.

Figure 14: Level-of-Service Criteria for Signalized and Unsignalized Intersections

LOS	Characteristics	Unsignalized Total Delay (sec)	Signalized Total Delay (sec)
A	Little or no delay	≤ 10.0	≤ 10.0
B	Short delays	10.1-15.0	10.1-20.0
C	Average delays	15.1-25.0	20.1-35.0
D	Long delays	25.1-35.0	35.1-55.0
E	Very long delays	35.1-50.0	55.1-80.0
F	Extreme delays	> 50.0	> 80.0

The delay thresholds for LOS at signalized and unsignalized intersections differ because of the driver's expectations of the operating efficiency for the respective traffic control conditions. According to HCM procedures, an overall LOS cannot be calculated for two-way stop-controlled intersections because not all movements experience delay. In signalized and all-way stop-controlled intersections, all movements experience delay and an overall LOS can be calculated.

The VTrans policy on level of service is:

- Overall LOS C should be maintained for state-maintained highways and other streets accessing the state's facilities
- Reduced LOS may be acceptable on a case-by-case basis when considering, at minimum, current and future traffic volumes, delays, volume to capacity ratios, crash rates, and negative impacts as a result of improvement necessary to achieve LOS C.
- LOS D should be maintained for side roads with volumes exceeding 100 vehicles/hour for a single lane approach (150 vehicles/hour for a two-lane approach) at two-way stop-controlled intersections.

5.2 Level-of-Service Results

The Highway Capacity Manual congestion reports within Synchro (v8), a traffic analysis software package from Trafficware, routinely relied upon by transportation engineering professionals, were used to assess congestion at the study intersections. Figure 15 and Figure 16 present the LOS results at signalized and unsignalized intersections, respectively.

As can be seen below, relatively long delays and Level of Service F conditions exist during the PM peak hour at the Riverside Avenue/Barrett Street/Colchester Avenue intersections and at the US 2/White Street intersection, with or without the addition of site-generated traffic. Delays at all other study area

intersections are projected to remain at acceptable levels and increase by 3 seconds per vehicle or less with the addition of project-generated traffic.

Figure 15: Level-of-Service Results at Signalized Intersections

Signalized Intersections	Level-of-Service Results											
	AM No Build			AM Build			PM No Build			PM Build		
	LOS	Delay	v/c	LOS	Delay	v/c	LOS	Delay	v/c	LOS	Delay	v/c
Colchester Ave/Riverside Ave/Mill St												
Overall	B	17	0.66	B	18	0.66	C	25	0.62	C	25	0.62
EB, exiting Riverside Ave	B	17	-	B	17	-	F	58	-	F	58	-
WB, exiting Mill St	D	41	-	D	41	-	D	40	-	D	40	-
NB, along Colchester Ave	A	4	-	A	4	-	A	5	-	A	5	-
SB, along Colchester Ave	C	23	-	C	23	-	B	12	-	B	12	-
Riverside Ave/Barrett St												
Overall	C	25	0.60	C	25	0.60	F	>100	0.75	F	>100	0.76
WB, exiting Barrett St	C	21	-	C	22	-	C	29	-	C	29	-
NB, along Riverside Ave	D	43	-	D	43	-	F	>100	-	F	>100	-
SB, along Riverside Ave	A	4	-	A	4	-	A	4	-	A	4	-
Colchester Ave/Barrett St												
Overall	B	18	0.68	C	20	0.69	F	>100	0.82	F	>100	0.83
EB, from Riverside Ave	A	7	-	A	7	-	A	8	-	A	8	-
WB, exiting Barrett St	E	74	-	F	84	-	F	>100	-	F	>100	-
NB, along Colchester Ave	B	19	-	B	20	-	D	43	-	D	43	-
SB, along Colchester Ave	A	5	-	A	5	-	A	3	-	A	3	-
Patchen Rd/White St												
Overall	B	17	0.62	B	18	0.66	C	26	0.71	C	27	0.73
EB, along White St	B	19	-	B	19	-	C	28	-	C	31	-
WB, along White St	C	30	-	C	31	-	D	51	-	D	53	-
NB, along Patchen Rd	A	10	-	A	10	-	B	16	-	B	16	-
SB, along Patchen Rd	B	13	-	B	14	-	B	14	-	B	15	-
US 2/White Street												
Overall	B	15	0.56	B	15	0.55	F	>100	1.08	F	>100	1.08
EB, along US 2	A	7	-	A	7	-	F	>100	-	F	>100	-
WB, along US 2	B	13	-	B	13	-	F	>100	-	F	>100	-
NB, exiting Midas Drive	D	50	-	D	50	-	F	89	-	F	90	-
SB, exiting White Street	D	35	-	D	35	-	D	44	-	D	44	-

Figure 16: Level-of-Service Results at Unsignalized Intersections

Unsignalized Intersections	Level-of-Service Results											
	AM No Build			AM Build			PM No Build			PM Build		
	LOS	Delay	v/c	LOS	Delay	v/c	LOS	Delay	v/c	LOS	Delay	v/c
Barrett St/Chase St												
EB Through/Right, along Barrett St	A	<1	0.19	A	<1	0.19	A	<1	0.15	A	<1	0.16
WB Left/Through, along Barrett St	A	2	0.04	A	2	0.04	A	2	0.07	A	2	0.07
NB Left/Right, exiting Chase St	B	11	0.07	B	11	0.07	B	11	0.19	B	11	0.20
Grove St/Site Access												
WB Left/Right, exiting Site Access	B	13	0.04	B	13	0.17	C	18	0.13	C	19	0.16
NB Through/Right, along Patchen Rd	A	<1	0.16	A	<1	0.15	A	<1	0.30	A	<1	0.34
SB Left/Through, along Patchen Rd	A	<1	0.01	A	<1	0.01	A	<1	0.01	A	<1	0.03
Patchen Rd/Kirby Rd												
WB Left/Right, exiting Kirby Rd	B	14	0.22	B	15	0.23	C	18	0.42	C	20	0.48
NB Through/Right, along Patchen Rd	A	<1	0.16	A	<1	0.15	A	<1	0.25	A	<1	0.27
SB Left/Through, along Patchen Rd	A	3	0.09	A	3	0.10	A	2	0.08	A	2	0.08

6.0 QUEUING ANALYSIS

In addition to the congestion analysis, estimated queues were evaluated using SimTraffic (v8).[1] The longest average maximum queues per intersection approach are presented in Figure 17. Relatively long queues currently exist within the Colchester Avenue/Riverside Avenue/Barrett Street triangle of intersections and remain in the build condition.[2] Afternoon peak hour queues are also relatively long on US 2 and queues of approximately 10 vehicles in length are experienced at the Patchen Road/White Street intersection, but are not expected to increase significantly with the addition of project traffic.

[1] Ten hour-long simulations were averaged together to estimate queue lengths. As each run is different, a difference in a few cars should not be seen as significant.

[2] Long WB queues on Barrett Street at Chase Street are the by-product of over-congested conditions at the Colchester Avenue/Barrett Street intersection and are not a result of conditions directly at the Barrett Street/Chase Street intersection.

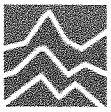


Figure 17: Queuing Results (# vehicles)

		Average Queue Length in Vehicles			
		AM Peak Hour		PM Peak Hour	
		No Build	Build	No Build	Build
Colchester Ave/Riverside Ave					
	EB	3	3	5	4
	WB	0	1	0	0
	NB	0	0	1	1
	SB	39	37	22	27
Riverside Ave/Barrett St					
	WB	2	2	2	2
	NB	13	12	>50	>50
	SB	5	4	4	4
Colchester Ave/Barrett St					
	EB	2	2	2	2
	WB	11	17	29	29
	NB	8	10	>50	>50
	SB	4	3	3	4
Barrett St/Chase St					
	EB	0	0	0	0
	WB	1	2	27	27
	NB	0	0	1	1
Grove St/Site Access					
	WB	1	2	2	1
	NB	0	0	0	0
	SB	0	0	0	1
Patchen Rd/Kirby Rd					
	WB	2	2	3	3
	NB	0	0	0	0
	SB	2	2	2	2
Patchen Rd/White St					
	EB	5	5	8	10
	WB	7	7	10	10
	NB	5	5	9	12
	SB	8	9	8	10
US 2/White St/Midas Dr					
	EB	7	7	54	57
	WB	7	7	>50	>50
	NB	2	3	10	11
	SB	2	2	5	5

7.0 SAFETY ANALYSIS

Crash histories were collected from VTrans (January 2006-December 2010) for the study area. VTrans maintains a statewide database of all reported crashes along all state highways and federal aid road segments.[1] Patterns within the crash data were examined and VTrans designated High Crash Locations (HCLs) were investigated in greater detail.

Based on the most recent *VTrans High Crash Location Report* (2006-2010)[2], there are three designated High Crash Location (HCL) intersections within the study area.

[1] This data is exempt from discovery or admission under 23 U.S.C. 409.

[2] This document is exempt from discovery or admission under 23 U.S.C. 409.

In order to be classified as an HCL, an intersection or road section (0.3 mile section) must meet the following two conditions:

1. It must have at least 5 crashes over a 5-year period
2. The Actual Crash Rate must exceed the Critical Crash Rate.

Figure 18 presents the location of the three designated HCLs within the project study area. These include the Colchester Avenue/Barrett Street intersection, the Patchen Road/White Street intersection, and the US 2/White Street intersection. Figure 18 also presents each HCL's rank in the entire VTrans HCL listing, which currently includes 124 HCL intersections statewide.

During the 5 year period of HCL designation (from 2006-2010), there were 15 crashes reported along the entire length of Grove Street in Burlington, and 44 crashes reported along the entire length of Patchen Road in South Burlington. However, aside from the Patchen Road/White Street intersection, no other HCL locations exist along Grove Street or Patchen Road. During this same period there were a total 4 crashes reported in the area of the proposed site access location.[1]

[1] The area of influence of the site access intersections is assumed to be within the design stopping sight distance of either access location (155' for a 25 mph roadway).

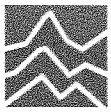
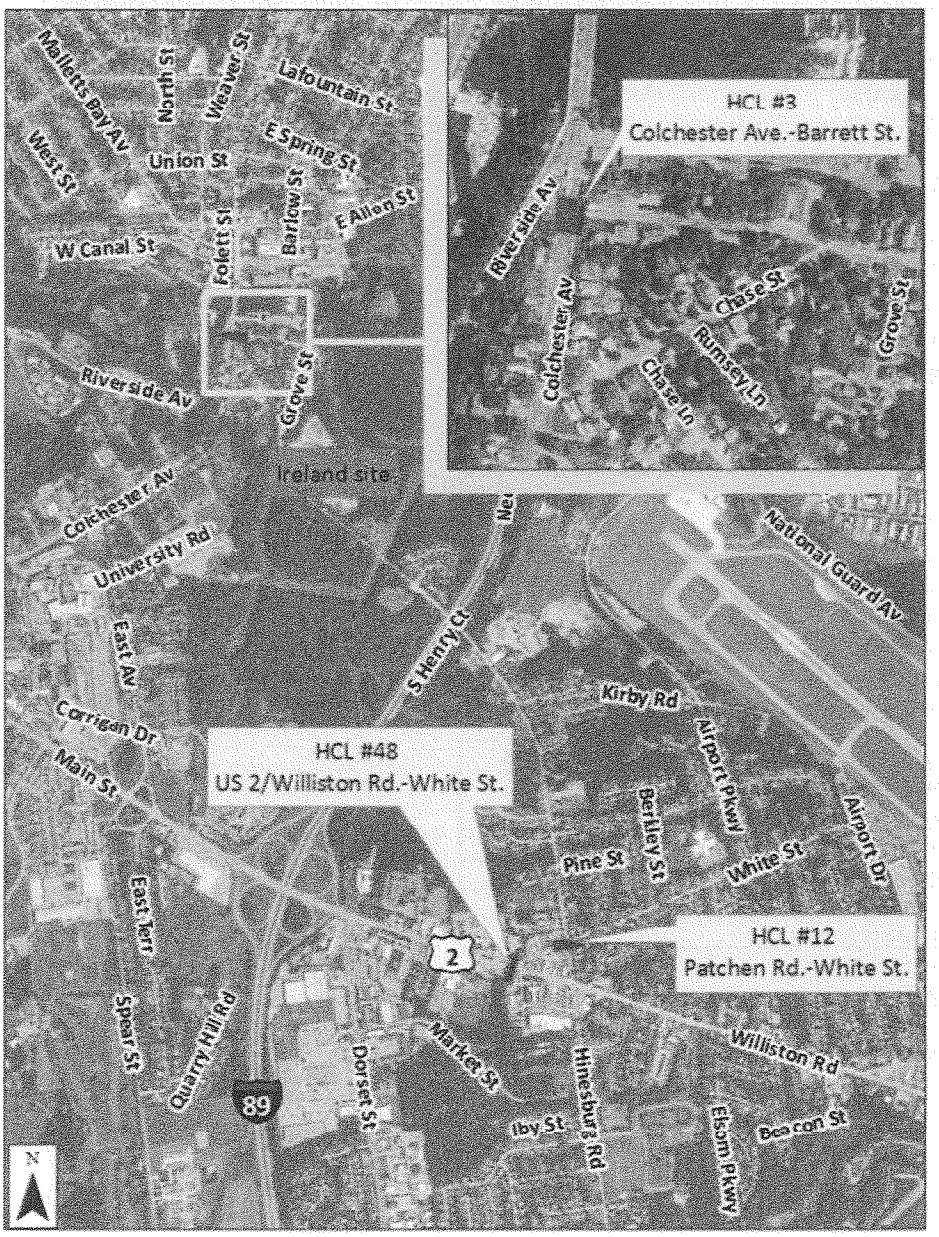


Figure 18: 2006-2010 HCLs



7.1 Riverside Avenue/Colchester Avenue/Barrett Street

This intersection is the third highest ranked HCL intersection in the state. Out of the 41 reportable crashes cited in the VTrans HCL report, nine involved injuries and the rest were property damage only; there were no fatalities.

In considering this intersection, we broadened our investigation to include crashes at the entire Colchester Avenue/Riverside Avenue triangle, within which there were 88 crashes reported in this same 5 year period. Of these 88 crashes, 13 crashes (15%) resulted in 18 injuries. No crashes resulted in any fatalities.

Weather does not appear to be a factor in crashes as shown in Figure 19 and Figure 21. Most crashes were rear-ends, although there were 17 same direction sideswipes (19%) and 11 left-turn and through conflicts (13%) (Figure 20). After inattention and unknown factors, circumstances that contributed to crashes included disregard for traffic control elements, failure to yield right of way, and following too closely. Following too closely may be the primary cause of the 44 rear end collisions (50%); the same direction sideswipes and left-turn/through conflicts may be attributed to the failure to yield right of way and disregard for traffic control.

Figure 19: Crash Details for the Colchester Ave/Riverside Ave/Barrett St Triangle

Type	Head-On	5
	Left-Turn and Through	11
	Single Vehicle Crash	3
	Through Movement Broadside	2
	Rear End	44
	Same Direction Sideswipe	17
	Other	6
	Total	88

Weather	Clear/Cloudy	61
	Rain	6
	Snow	12
	Sleet/Hail	1
	Unknown	8
	Total	88

Contributing Circumstances	Disregarded traffic signs, signals, road markings	8
	Operating vehicle in erratic, reckless, careless, negligent, or aggressive manner	4
	Driving too fast for conditions	6
	Failure to keep in proper lane	4
	Followed too closely	8
	Failed to yield right of way	8
	Made an improper turn	4
	Other improper action	5
	Inattention	27
	Operating defective equipment	3
	Visibility obstructed	4
	Swerving or avoiding due to wind, slippery surface, vehicle, object, non-motorist in roadway etc	3
	Under the influence of medication/drugs/alcohol	1
	Unknown	18

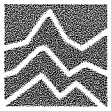


Figure 20: Types of Crashes at the Colchester Ave/Riverside Ave/Barrett St Triangle

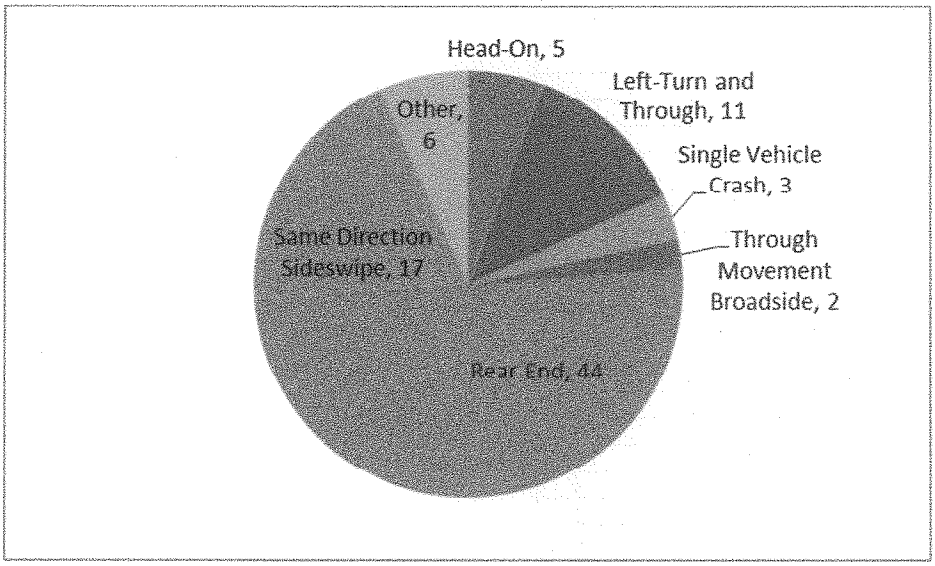
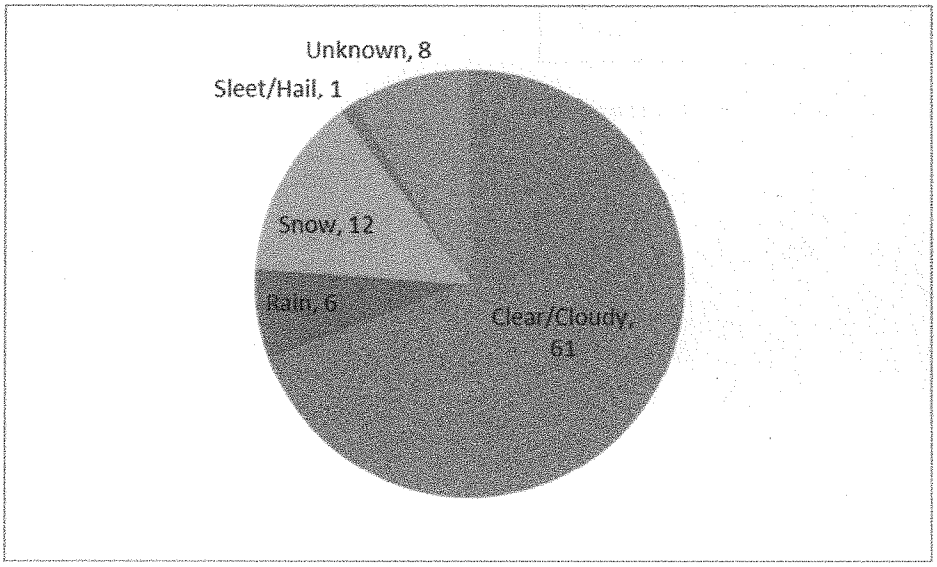


Figure 21: Weather Conditions during Crashes at the Colchester Ave/Riverside Ave/Barrett St Triangle



7.2 Patchen Road/White Street

This intersection is the twelfth highest ranked HCL intersection in the state. Out of the 40 reportable crashes cited in the VTrans HCL report, 6 involved injuries (15%) and the rest were property damage only; there were no fatalities.

Weather does not appear to be a factor in crashes as shown in Figure 22 and Figure 24. Many crashes were rear-ends, although there were 6 through-movement broadsides (15%) and 5 left-turn and through conflicts (13%) (Figure 23). Failure to yield right of way contributed to 10 crashes (25%) and could certainly be the reason there were so many through-movement broadside crashes. However, red-light running ("disregard for traffic signs, etc.") was only cited as a contributing circumstance in one crash.

Figure 22: Crash Details for the Patchen Road/White Street Intersection

Type	Head-On	2
	Left-Turn and Through	5
	Single Vehicle Crash	2
	Through Movement Broadside	6
	Rear End	20
	Same Direction Sideswipe	1
	Other	4
	Total	40

Weather	Clear/Cloudy	34
	Rain	2
	Snow	1
	Unknown	3
	Total	40

Contributing Circumstances	Disregarded traffic signs, signals, road markings	1
	Inattention	12
	Driving too fast for conditions	2
	Failure to keep in proper lane	2
	Followed too closely	6
	Failed to yield right of way	10
	Made an improper turn	2
	Other improper action	2
	Under the influence of medication/drugs/alcohol	2
	Unknown	4

Figure 23: Types of Crashes at the Patchen Road/White St Intersection

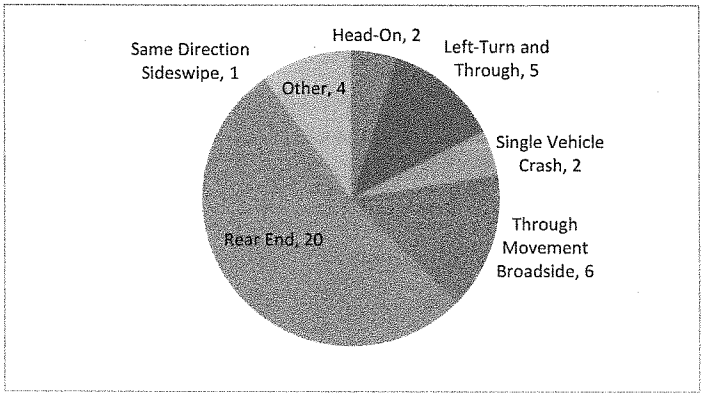
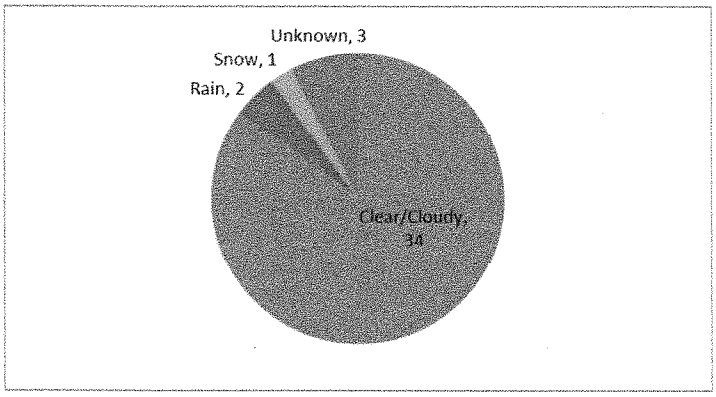


Figure 24: Weather Conditions during Crashes at the Patchen Road-White St Intersection



7.3 US 2/White Street

This intersection is the 48th highest ranked HCL intersection in the state. Out of the 62 reportable crashes cited in the VTrans HCL report, 4 involved injuries (7%) and the rest were property damage only; there were no fatalities.

Weather does not appear to be a factor in crashes as shown in Figure 25 and Figure 27. Most crashes were rear-ends, although there were 12 same direction sideswipes (19%), (Figure 26). After inattention, following too closely was the most frequently cited circumstance that contributed to crashes. It would easily be suspected that "failure to keep in proper lane" would be the primary reason for 12 same direction sideswipes (19%), but this was only cited in four crashes, so "inattention" may be the reason for these.

Figure 25: Crash Details for the US 2/White Street Intersection

	Left-Turn and Through	6
	Single Vehicle Crash	1
	Through Movement Broadside	3
	Rear End	33
	Same Direction Sideswipe	12
	Other	7
	Total	62

Weather	Clear/Cloudy	48
	Rain	10
	Sleet/Hail	2
	Unknown	2
	Total	62

Contributing Circumstances	Disregarded traffic signs, signals, road markings	1
	Operating vehicle in erratic, reckless, careless, negligent, or aggressive manner	3
	Failure to keep in proper lane	4
	Followed too closely	20
	Failed to yield right of way	12
	Made an improper turn	3
	Other improper action	4
	Inattention	26
	Visibility obstructed	3
	Swerving or avoiding due to wind, slippery surface, vehicle, object, non-motorist in roadway etc	3
	Under the influence of medication/drugs/alcohol	1
	Unknown	6

Figure 26: Types of Crashes at the US2/ White St Intersection

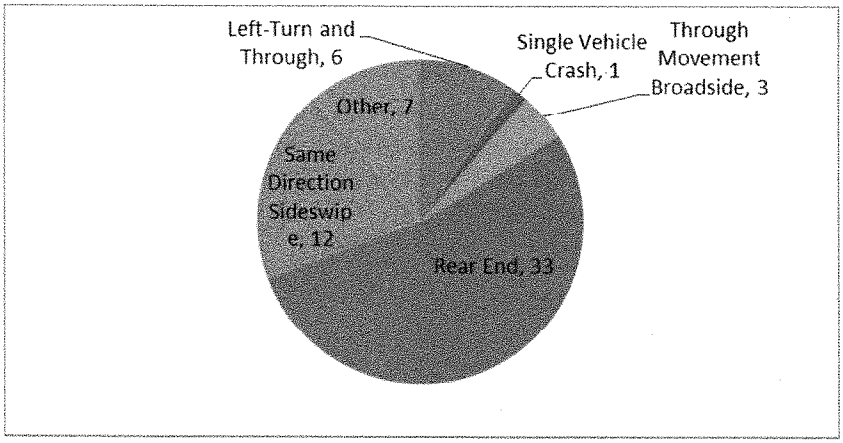
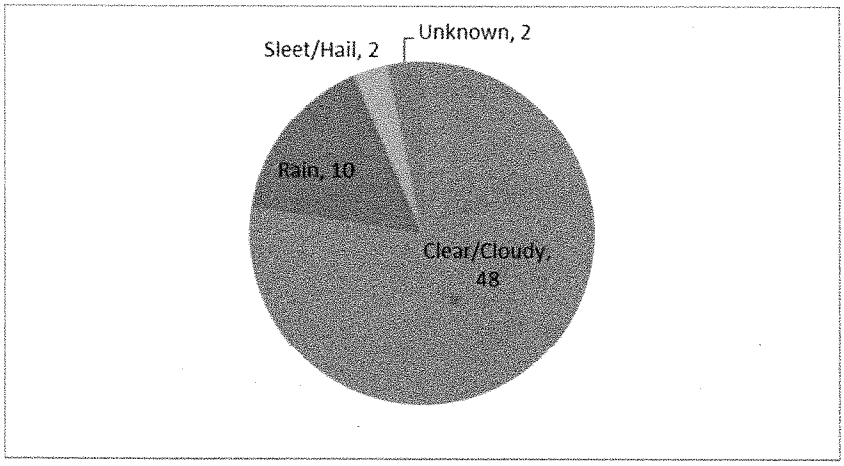


Figure 27: Weather Conditions during Crashes at the US2/Williston Road-White St Intersection



7.4 Sight Distance Assessment

As defined in the 2011 publication *A Policy on Geometric Design of Highways and Streets,* from the American Association of State Highway and Transportation Officials (AASHTO), sight distance is the "the length of roadway ahead that is visible to the driver."[1] Sight distances of sufficient length are necessary at all points along a roadway to ensure vehicles can safely stop or avoid colliding with potential obstructions or other vehicles on the roadway.

Standard practice in assessing intersection safety and operations involves measuring two separate sight distances – **stopping sight distance** and **intersection sight distance.**

7.4.1.1 Stopping Sight Distance

Stopping sight distance is the visible distance along a roadway between an advancing motorist and a potential obstacle in the roadway. It is measured from a point representing the approaching driver's eye and a point representing an obstacle in the roadway.[2] Stopping sight distances of adequate length are needed along all roadways, both at and away from intersections, so that drivers travelling at design speeds can react to potential obstacles and safely brake to avoid collisions. Design minimum stopping sight distances are calculated based on factors such as design speed, response times, and grades as reported in the *2011 Policy on Geometric Design of Highways and Streets.*[3]

At the project access, Grove Street has a posted speed limit of 25 mph and is relatively flat. The design minimum stopping sight distances at the project access is 155 feet.

Stopping sight distances both north and south of the project access were measured in the field and were found to be at least 400 feet north and south of the proposed access location, exceeding the design standard.

7.4.1.2 Intersection Sight Distance

Intersection sight distance is the distance available along the major road travelled way corresponding with the maximum visibility between an advancing motorist on the major road and an entering motorist on an intersecting minor road. It is measured between a point representing the advancing driver's eye above the major road and the entering driver's eye above the intersecting road.[4]

The *2011 Policy on Geometric Design of Highways and Streets* states that the available intersection sight distance should be at least equal to the required stopping sight distance along the major road, which in this case equals 155 feet.

> *"Sight distance is also provided at intersections to allow the drivers of stopped vehicles a sufficient view of the intersecting highway to decide when to enter the intersecting highway or to cross it. If the available sight distance for an entering or crossing vehicle is at least equal to the appropriate*

[1] American Association of State Highway and Transportation Officials, *A Policy on Geometric Design of Highways and Streets*, Fifth Edition (Washington D.C.: American Association of State Highway and Transportation Officials, 2011). Page 3-2.

[2] As noted in the *2011 Policy on Geometric Design of Highways and Streets (page3-14 to 3-15),* the height of the driver's eye is assumed to be 3.5' above the road surface and the height of a potential obstacle is 2.0' above the road surface.

[3] American Association of State Highway and Transportation Officials, *A Policy on Geometric Design of Highways and Streets*, Fifth Edition (Washington D.C.: American Association of State Highway and Transportation Officials, 2011). Page 3-5.

[4] As noted in the *2011 Policy on Geometric Design of Highways and Streets (page3-14 to 3-15),* the height of the driver's eye of the approaching vehicle is assumed to be 3.5' above the road surface of the major road and the height of the driver's eye of the entering vehicle is assumed to 3.5' above the minor road surface and 14.5' back from the edge of the major road travelled way. VTrans standard B-71 suggest the entering driver's eye should be measured 15' back from the edge of the major road travelled way and we have followed this practice in our measurements.

stopping sight distance for the major road, then drivers have sufficient sight distance to anticipate and avoid collisions."[1]

However, when possible it is desirable to have intersection sight distances that exceed the design minimum stopping sight distances in order to offer improved operations, such that major road traffic need not decelerate to accommodate entering traffic.

"However, in some cases a major-road vehicle may need to stop or slow to accommodate the maneuver by a minor road vehicle. To enhance traffic operations, intersection sight distances that exceed stopping sight distances are desirable along the major road."[2]

Desirable target intersection sight distances are based on design speeds. For the section of Grove Street proximate to the project access, the design target intersection sight distance in either direction is 280 feet.

Intersection sight distances both north and south of the project access were measured in the field and were found to be at least 400 feet north and south of the proposed access location, exceeding both the design standard and desired target distance (Figure 28).

[1] American Association of State Highway and Transportation Officials, *A Policy on Geometric Design of Highways and Streets*, Fifth Edition (Washington D.C.: American Association of State Highway and Transportation Officials, 2011). Page 9-29

[2] American Association of State Highway and Transportation Officials, *A Policy on Geometric Design of Highways and Streets*, Fifth Edition (Washington D.C.: American Association of State Highway and Transportation Officials, 2011). Page 9-29

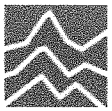
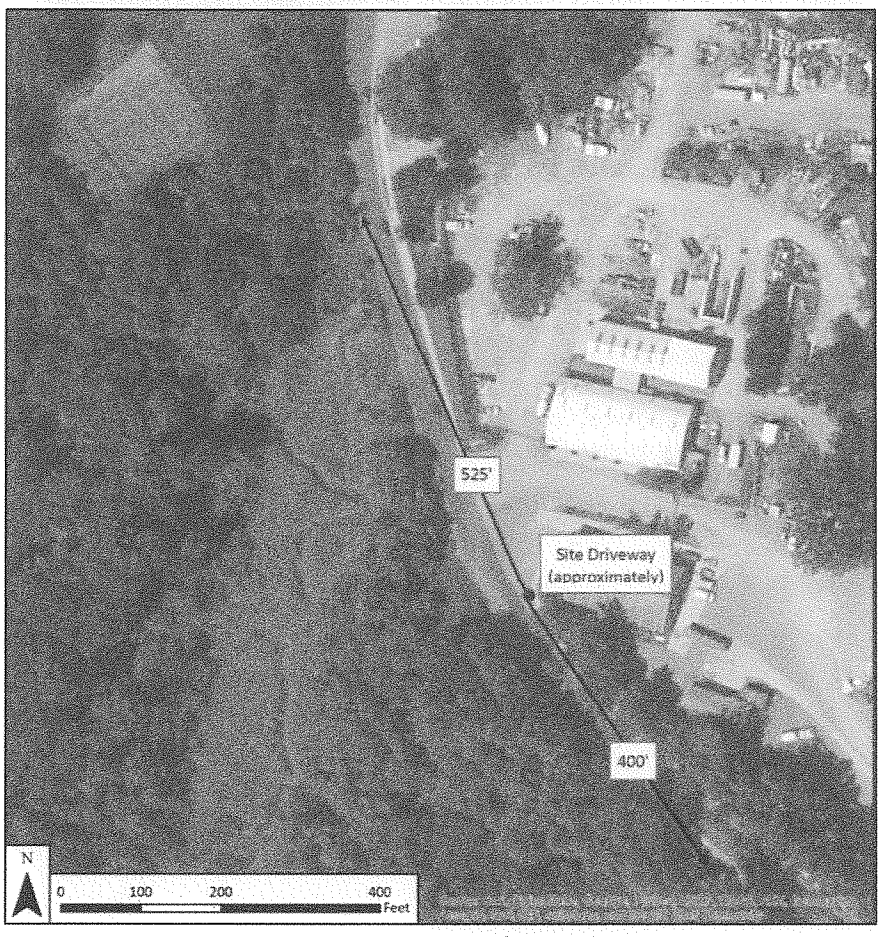


Figure 28: Measured Sight Distances



7.5 Turn Lane Warrant Assessment

In assessing the proposed site access, we conducted a turn lane warrant analysis to determine if projected peak hour traffic volumes are sufficient to meet warrant thresholds for construction of a dedicated left-turn lane into the site. Dedicated left-turn lanes have the safety and capacity benefits of removing left-turning traffic from the through volume traffic stream but also promote higher vehicle speeds and require increased pavement widths.

Using the scenario volumes, we conducted a left-turn lane warrant analysis at the Grove Street/Site Access intersection. Using Harmelink's methodology for unsignalized intersections, we found that volume warrants necessary for construction of a dedicated southbound left-turn lane are not met during the weekday PM peak hour at this site.

We also examined left-turn lane warrants using a second methodology developed by Kikuchi and Chakroborty (1991), which modified the Harmelink equation to correct errors in its application of queuing theory.[1] This method provided identical results to the Harmelink method.

[1] Larson, Larry & Fred L. Mannering, *Method for Prioritizing Intersection Improvements*, January 1997, Washington State Transportation Commission, Department of Transportation and U.S. Department of Transportation, Federal Highway Administration, 2 June 2003.

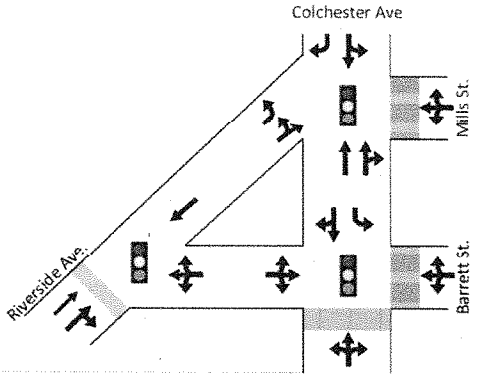
Based on this analysis we believe the proposed access configuration will effectively accommodate site generate traffic and do not recommend any additional turn lanes be constructed.

8.0 PLANNED ROADWAY IMPROVEMENTS

8.1 Colchester Avenue Corridor Plan

In 2011, RSG completed the *Colchester Avenue Corridor Plan* for the Chittenden County Regional Planning Commission (CCRPC).[1] This plan included recommendations for the Colchester Avenue/Riverside Avenue/Barrett Street intersection triangle, noting that the close spacing of the three traffic signals creates multiple conflict points and inefficiencies for vehicles, pedestrians, and bicyclists (Figure 29). To mitigate these issues, the Plan recommended consolidating the vehicle movements into one signalized intersection realigning Riverside Avenue to intersect Colchester Avenue directly opposite Barrett Street, and replacing the signal at Mill Street with a stop sign (Figure 30).

Figure 29: Existing Configuration at the Colchester Avenue/Riverside Avenue Triangle



[1] http://www.ccrpcvt.org/library/colchester_ave/20111219_Colchester_Ave_Corridor_Plan_Final.pdf

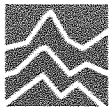
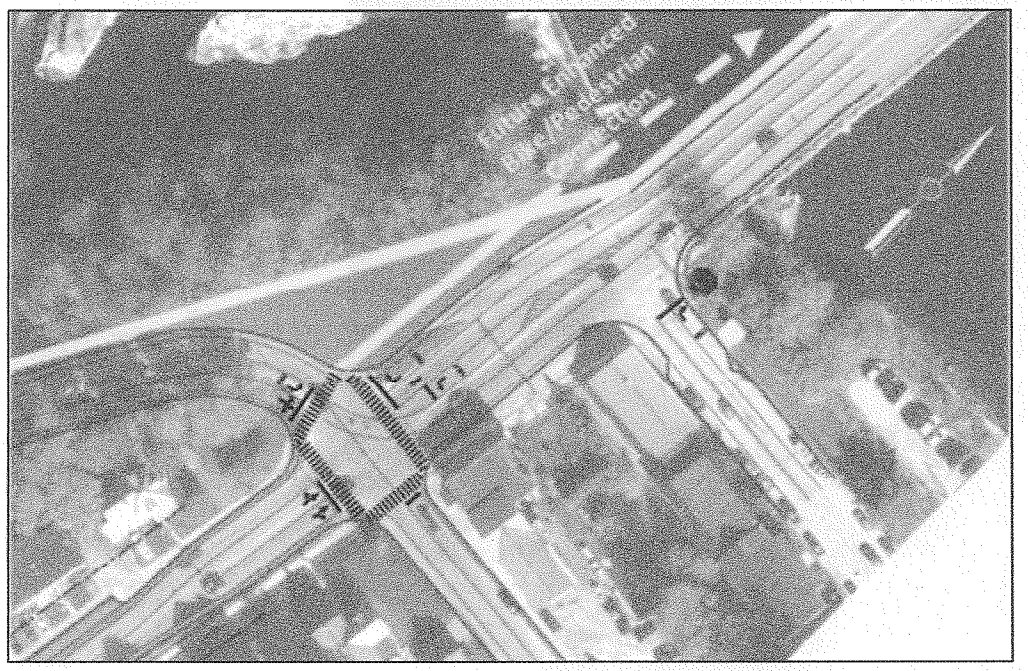


Figure 30: Proposed Consolidation Recommended in Colchester Avenue Corridor Plan



The Plan also recommends considering traffic calming measures for Chase Street, which is used as a cut-through for traffic between Colchester Avenue and Grove Street. Any traffic calming plan should follow the Burlington Traffic Calming and Neighborhood Enhancement Program process to gather input from neighbors and evaluate advantages and disadvantages.

8.2 Market Street Improvements

As part of the South Burlington City Center project, a new street connection is planned between Dorset Street and US 2 by connecting the existing Market Street with Midas Drive. Figure 31 presents the proposed street configuration, which includes a realignment of the US 2/White Street intersection, bringing White Street in alignment opposite Midas Drive, and construction of left-turn lanes on US 2. This configuration is intended to improve safety and operations at the intersection by eliminating the existing off-set White Street and Midas Drive approaches and by adding protected exclusive left-turn lanes on US 2. Improvements along Market Street are currently slated for fiscal year 2016 in the 2013-2016 CCRPC Transportation Improvement Program (TIP). Full improvements at the US 2/White Street intersection, are currently planned but are not yet included in the near term Transportation Improvement Program.

Figure 31: Proposed Roadway Alignment from Market Street Improvements[1]

[1] Market Street improvement layout was taken from the *South Burlington, Market Street Improvements STP 5200 (17) Revised Environmental Assessment*, VHB, May 2010.

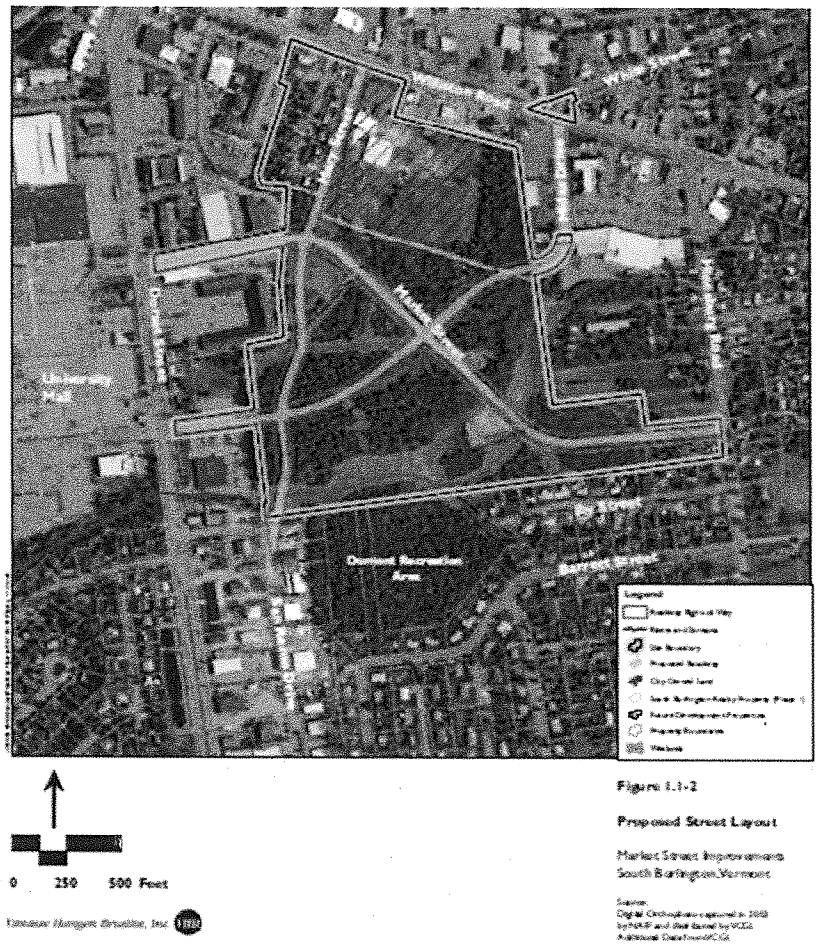
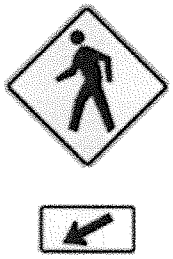


Figure 1.1-2

Proposed Street Layout

Market Street Improvements
South Burlington, Vermont

Figure 32: Recommended Pedestrian Warning Signs (MUTCD W11-2 and W16-7P)



8.3 Grove Street Traffic Calming and Pedestrian Improvements

The proposed project site plan includes reconfiguration of the site access and additional off-site roadway improvements in the area adjacent to the Grove Street/Site Access intersections. These improvements include construction of new sidewalk connections both north and south of the project site, new and repainted crosswalks, a new raised center island south of the project access, installation of a solar powered speed monitoring sign, relocation of an existing no parking sign on Grove Street south of Barrett Street, new curbing, and better designation of paved public parking. These enhancements, as proposed by O'Leary Burke Civil Associates, are presented in (Figure 33 and Figure 35).

These off-site improvements provide enhanced pedestrian connectivity between the project and existing pedestrian infrastructure in the area and improve the overall pedestrian environment in this area. They provide a critical pedestrian connection to the south by linking existing sidewalks in South Burlington with sidewalks in Burlington and Winooski. In addition to the pedestrian improvements called out below, we recommend the existing pedestrian warning signs at the north end of the paved public parking area be upgraded to new fluorescent yellow signs (W11-2) with diagonal arrows (W16-7P) indicating the crosswalk location, and that these be gate posted on either side of the crosswalk facing both northbound and southbound grove street traffic. We suggest similar signage be installed at the second crossing approximately 300 feet north of this parking area at the north end of the park.

Figure 33: Off-Site Pedestrian Improvements – South of Site

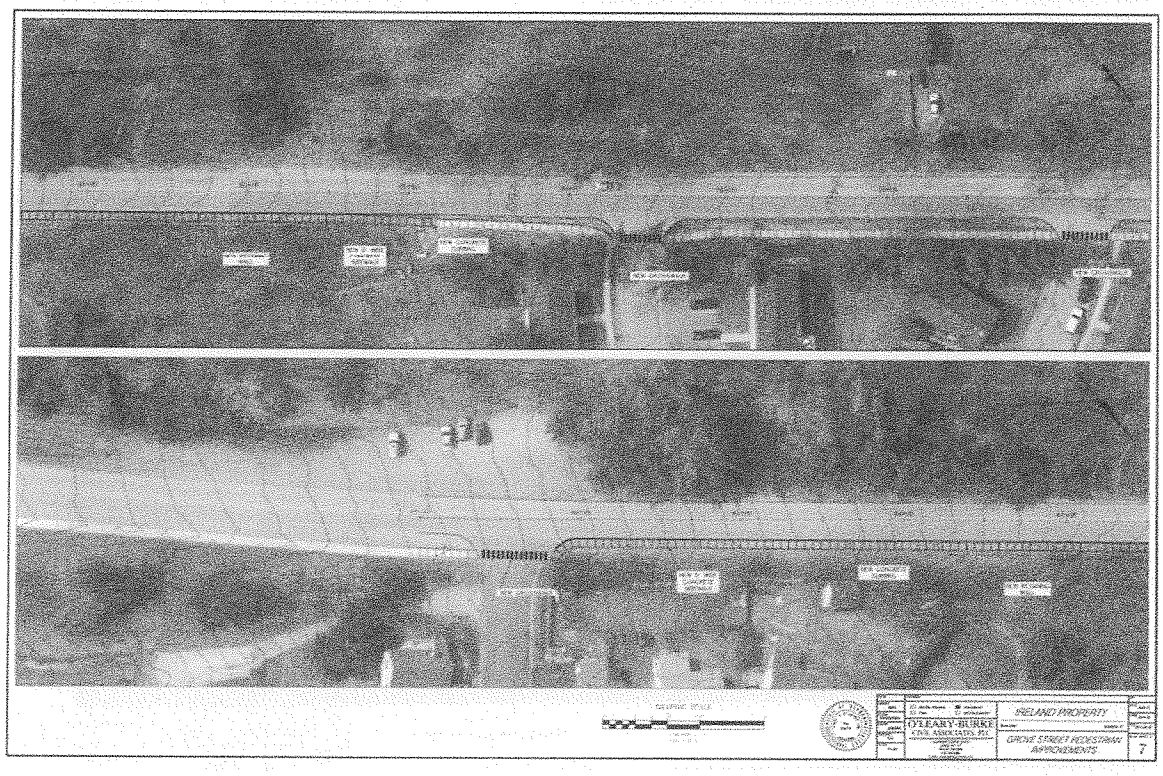


Figure 34: Off-Site Pedestrian Improvements – Adjacent to Site

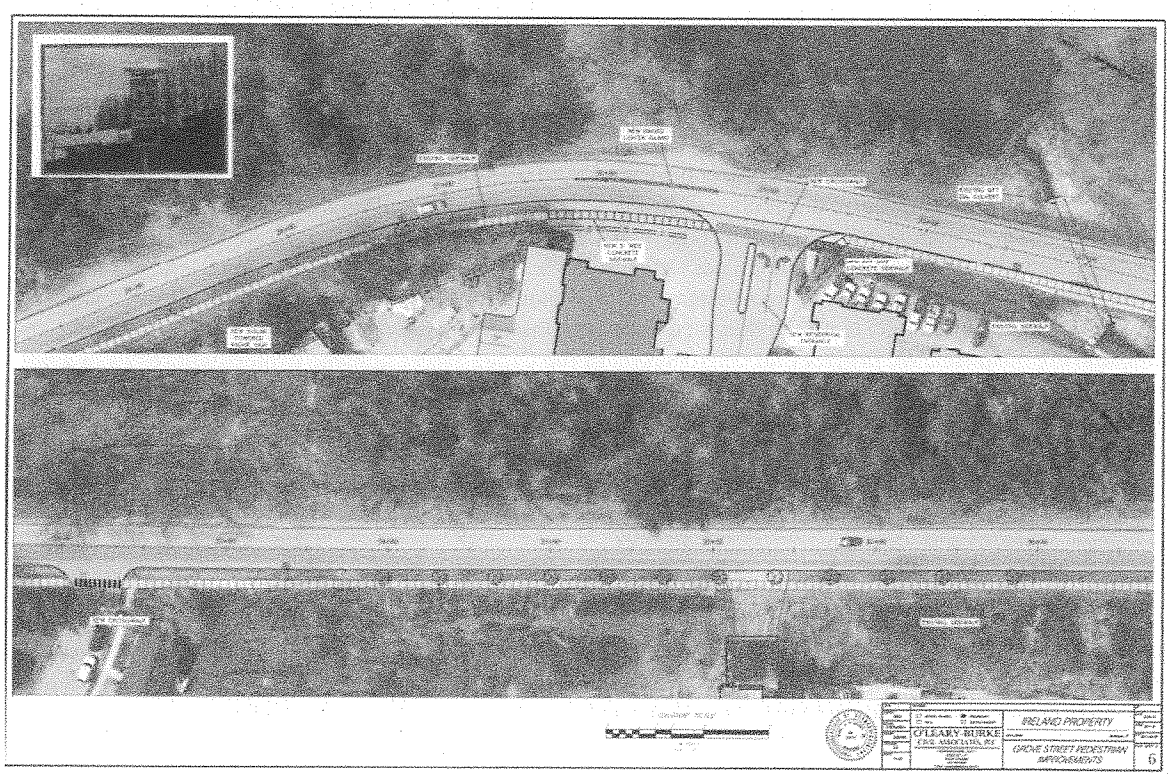
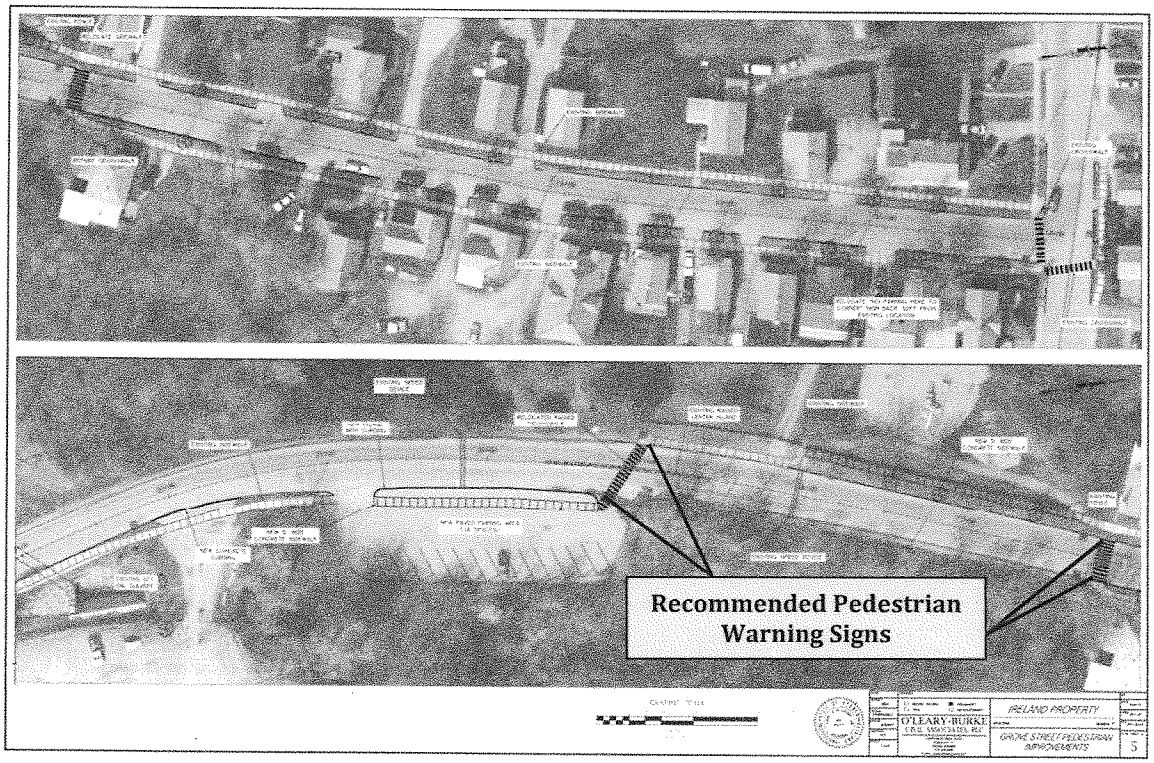


Figure 35: Off-Site Pedestrian Improvements – North of Site



9.0 Recommended Mitigation Measures

9.1 Colchester Avenue/Riverside Avenue/Barrett Street

Due to the existing congestion and safety concerns at the Colchester Avenue/Riverside Avenue/Barrett Street triangle, we recommend the preferred intersection design alternative from the Colchester Avenue Corridor Plan be pursued at this location (Figure 30). However, this is a long existing problem, to which the proposed project would add only 26 passenger vehicle trips during the weekday AM peak hour and 27 passenger vehicle trips during the weekday PM peak hour. Additionally, construction of this project would reduce heavy vehicle traffic in this area by approximately 10 heavy vehicle trips per hour.[1] For cost sharing purposes, we project that construction of the Grove Street housing project will result in a net increase in traffic volumes at the Colchester Avenue/Riverside Avenue triangle of 0.36% during the AM peak hour (a net increase of 10 vehicle trips) and 0.43% during the PM peak hour (a net increase of 14 vehicle trips).[2]

[1] Additionally, some passenger vehicle trips associated with existing concrete plant staff would be eliminated with the proposed project.

[2] The December 2011 Colchester Avenue Corridor Plan, conducted by Resource Systems Group indicated an approximate project cost of $1.4 million to reconstruct the Colchester Avenue/Riverside Avenue/Barrett Street intersection triangle. Applying the peak hour percent increase in traffic associated with the proposed project (highest during the PM peak hour at 0.43%) to the estimated project cost results in a proportional project share of approximately $6,000.

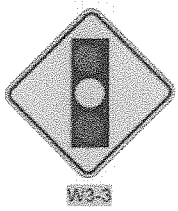
9.2 US 2/White Street Intersection

The US 2/White Street intersection is currently slated for major improvements that will realign White Street opposite Midas Drive and will add left-turn lanes on US 2. These improvements are anticipated to improve overall intersection operations and safety. Improvements along Market Street are currently slated for fiscal year 2016 in the 2013-2016 CCRPC Transportation Improvement Program (TIP). Full improvements at the US 2/White Street intersection, are currently planned but are not yet included in the near term Transportation Improvement Program. The proposed project is expected to increase overall intersection volumes at this intersection by 0.41% during the weekday AM peak hour (a net increase of 10 vehicle trips) and by 0.38% during the weekday PM peak hour (a net increase of 13 vehicle trips).[1]

9.3 Patchen Road/White Street Intersection

At the Patchen Road/White Street intersection, overall LOS B is maintained during the weekday AM peak hour and overall LOS C is maintained during the weekday PM peak hour with the addition of project generated traffic. However, historic crash data indicates this area is a High Crash Location and intersection improvements here could improve overall operations and safety. Suggested Federal Highway Administration guidelines for determining if a protected left-turn phase is warranted at a signalized intersection state that if the product of the hourly left-turn volume and the hourly opposing volume exceeds 50,000, and there are more than 2 left-turn vehicles per cycle during that peak hour (or roughly more than 100 left-turns per hour) a protected left-turn phase should be considered.[2] At this intersection, both the eastbound left and westbound left turn movements exceed 100 left-turns per hour during the PM peak hour. However, the product of left-turn and opposing traffic is less than 50,000 for both approaches (~43,000 for the westbound approach and ~26,000 for the eastbound approach). The FHWA guidelines further indicate if 5 or more crashes involving left-turning vehicles occur within a 12 month period, a protected left-turn phase should also be considered. However, at this intersection there were 5 crashes involving left-turning vehicles in an entire 5 year period, rather than in any single year. While future conditions may indicate the addition of eastbound and westbound left-turn lanes and left-turn phasing is necessary, currently projected Build scenario volumes do not meet the recommended guidelines at this time. Additionally, the highest frequency crash type at this intersection was a rear-end collision, which comprised 20 of the 40 total crashes in the past 5 years of available data. Due to the high prevalence of rear-end collisions at this intersection we recommend advance intersection warning signs (MUTCD W3-3) be installed on the eastbound and westbound White Street approaches to this intersection. Similar signs currently exist on the northbound and southbound, Patchen Road approaches.

Figure 36: Recommended Warning Sign for White Street Approaches to Patchen Road/White Street Intersection



The proposed project is expected to increase traffic volumes at the Patchen Road/White Street intersection by approximately 3% during the weekday AM and PM peak hours.

[1] The August 2007 US 2 Corridor Study, conducted by Resource Systems Group indicated an approximate project cost of $3.94 million to reconstruct the US 2/White Street and US 2/Patchen Road intersections. Applying the peak hour percent increase in traffic associated with the proposed project (highest during the AM peak hour at 0.41%) to the estimated project cost results in a proportional project share of approximately $16,000.

[2] *Signalized Intersections: Informational Guide*, Federal Highway Administration, Publication No. FHWA-HRT-04-091, 2004. Table 118

10.0 Impact Fee Calculations

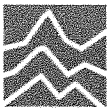
Within the City of Burlington new development projects are subject to various impact fees intended to help offset the costs associated with construction and maintenance of public infrastructure. Applying the proposed project's overall square footage of new housing (291,250 square feet) to the City's traffic impact fee calculator[1], we calculate traffic impact fees of approximately $53,600 for this project.

11.0 Conclusions and Recommended Mitigation Measures

11.1 Conclusions

9. The proposed Grove Street housing project would replace the existing SD Ireland concrete batch plant on Grove Street in Burlington, Vermont with a 247 unit apartment development.
10. Using trip generation rates presented by the Institute of Transportation Engineers (ITE) for this land use, we calculate this project would generate approximately 125 new vehicle trips during the AM peak hour (25 entering and 100 exiting) and 154 vehicle trips during the PM peak hour (100 entering and 54 exiting).
11. Removal of the existing SD Ireland concrete plant will result in a reduction of existing concrete plant traffic, including heavy vehicle and passenger car traffic, in this area. Based on average production levels and existing administrative operations at the plant, we expect this project to eliminate approximately 61 existing AM peak hour trips (41 entering and 20 exiting) and approximately 61 existing PM peak hour trips (22 entering and 39 existing) from the local roadways.
12. Long delays and Level of Service F conditions exist at the Riverside Avenue/Barrett Street and Colchester Avenue/Barrett Street intersections and at the US 2/White Street intersection, with or without the addition of site-generated traffic. Delays at all other study area intersections are projected to remain at acceptable levels and increase by fewer than 5 seconds per vehicle with the addition of project generated traffic.
13. A review of historic VTrans crash data identified three High Crash Locations within the study area at the Colchester Avenue/Barrett Street intersection, at the Patchen Road/White Street intersection, and at the US 2/White Street intersection.
14. RSG recently conducted the Colchester Avenue Corridor study as a planning document for the Chittenden County Regional Planning Commission and identified a preferred alternative for reconstructing the Colchester Avenue/Riverside Avenue intersection triangle and we recommend this improvement be pursued to improve both operations and safety in this area, with or without the proposed project.
15. At the US 2/White Street intersection, major improvements are currently planned as part of the City Center initiative and Market Street improvements project. Improvements on Market Street are currently slated for fiscal year 2016 in the 2013-2016 CCRPC Transportation Improvement Program (TIP). Full improvements at the US 2/White Street intersection, are currently planned but are not yet included in the near term Transportation Improvement Program.
16. At the Patchen Road/White Street intersection overall LOS B and LOS C conditions are maintained during the weekday AM and PM peak hours, respectively, with the addition of project generated traffic.

[1] http://www.burlingtonvt.gov/Content.aspx?id=2321



17. Using the City of Burlington's impact fee calculator, we calculate approximately $53,600 in traffic impact fees to be associated with the proposed project.
18. We have also examined the proposed site access on Grove Street and have found that stopping and corner sight distances exceed design standards in both directions.
19. We conducted a turn-lane warrant assessment and found that a dedicated left-turn lane is not warranted on Grove Street at the site access.
20. We project average vehicle delays of less than 20 seconds per vehicle for traffic exiting the site driveway and expect the access to operate safely and effectively.
21. We have examined plans for proposed off-site traffic calming and pedestrian accommodation improvements prepared by O'Leary Burke Civil Associates including new sidewalks, crosswalks, new curbing, new lighting, and a proposed solar powered speed feedback display.
22. We believe the proposed pedestrian improvements greatly enhance the existing infrastructure. The proposed sidewalk section south of the project site provides a critical pedestrian link between South Burlington and Burlington and Winooski, creating a continuous pedestrian route between these areas. Additionally, improved curbing signage and striping at crossings north of the project site will help improve pedestrian safety for all pedestrians in the area.

11.2 Recommended Mitigation Measures

23. We recommend a cost sharing allocation be paid by the developer to the City of Burlington towards eventual improvements at the Colchester Avenue/Riverside Avenue/Barrett Street intersection triangle. This area currently experiences long delays and has been identified for future improvements by the Chittenden County Regional Planning Commission c. While the proposed project does not cause this issue, we suggest the developer make a fair share contribution towards the ultimate intersection improvements based on the percent increase in peak hour traffic from the proposed project and the estimated cost of the overall improvement. Based on the larger peak hour percent increase in traffic (0.43% during the PM peak) and the estimated project cost ($1.4 million)[1], we calculate a fair share contribution of approximately $6,000.
24. We recommend a cost sharing allocation be paid by the developer to the City of South Burlington towards eventual improvements at the US 2/White Street intersection. This area currently experiences long delays and has been identified for future improvements by the Chittenden County Regional Planning Commission based on heavy use by existing traffic. While the proposed project does not cause this issue, we suggest the developer make a fair share contribution towards the ultimate intersection improvements based on the percent increase in peak hour traffic from the proposed project and the estimated cost of the overall improvement. Based on the larger peak hour percent increase in traffic (0.41% during the AM peak) and the estimated project cost ($3.94 million) [2], we calculate a fair share contribution of approximately $16,000.
25. Due to the high prevalence of rear-end collisions at the Patchen Road/White Street intersection we recommend advance intersection warning signs (MUTCD W3-3) be installed on both the eastbound and westbound, White Street, approaches to this intersection. Similar signs already exist on the northbound and southbound, Patchen Road approaches (Figure 36).

[1] The December 2011 Colchester Avenue Corridor Plan, conducted by Resource Systems Group indicated an approximate project cost of $1.4 million to reconstruct the Colchester Avenue/Riverside Avenue/Barrett Street intersection triangle.

[2] The August 2007 US 2 Corridor Study, conducted by Resource Systems Group indicated an approximate project cost of $3.94 million to reconstruct the US 2/White Street and US 2/Patchen Road intersections.

26. To enhance pedestrian connectivity and to improve pedestrian accommodations proximate to the project site, we recommend all off-site traffic calming and pedestrian enhancements identified by O'Leary Burke Civil Associates be installed prior to the first certificate of occupancy for the project.

27. In addition to the pedestrian enhancements proposed by O'Leary Burke Civil Associates we recommend the existing pedestrian warning signs at the crosswalk on Grove Street north of the paved public parking area (north of the project access) be upgraded to new fluorescent yellow warning signs (W11-2) and be accompanied by diagonal arrows indicating the crossing location (W16-7P) and that these signs be gate-posted for both northbound and southbound traffic prior to the first certificate of occupancy for the project. We recommend similar signage be installed at the second pedestrian crossing approximately 300 feet north of this parking area at the north end of the park.

28. Due to the tight turning radius for the southbound right-turn from Barrett Street onto Grove Street, we recommend the "No Parking Here To Corner" sign be relocated as indicated by O'Leary Burke Civil Associates, assuming Burlington Public Works is willing to accept the associated reduction in on-street parking.

In conclusion, we believe that if the above recommendations are followed, traffic associated with construction of the proposed Grove Street housing project will not cause unreasonable congestion or unsafe conditions on the surrounding road network.